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CALCULATION OF THE ATTENUATION AND PHASE DISPLACEMENT PER UNIT OF LENGTH DUE TO RAIN COMPOSED OF ELLIPSOIDAL DROPS

Dario Maggiori

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1. Introduction

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A knowledge of the "scatter" (or diffusion) of individual hydrometeors (rain, snow, hail) is indispensable in the study of the effects caused by a population of hydrometeors on the propagation of radiowaves at frequencies above 10 GHz.

As a matter of fact all of the phenomena which influence propagation at such frequencies (attenuation, depolarization, scintillation, etc.) can be intensified by parameters directly derived from a solution of individual scatter, naturally in addition to the meteorological elements which characterize the physical medium.

This paper will go into detail on the diffusion caused by rainy precipitation; the physical models which will be taken into consideration are rain composed of spherical drops, rain composed of drops in an ellipsoidal form with axes of rotational symmetry arranged along the vertical line of a generic reference point.

Since the most general type of electromagnetic wave polarization, including circular polarization and rectangular polarization as special cases, is elliptical polarization, there is a certain amount of interest in a detailed study, as complete as possible, of the effects of diffusion on tropospheric propagation of electromagnetic waves in the presence of rain alone with generic polarization, specified for the cases of interest to us within the "range" of frequency from 10 to 100 GHz.

The case of earth-space propagation will not be treated in detail in the present work, although for the sake of completeness there will be a report of attenuation and phase displacement results obtained for some possible $link_s$ with axes of propagation inclined with respect to the vertical line in the case of rectilinear polarization alone.

2. Rain Composed of Spherical Drops: G. Mie's Algorithm

The diffusion due to drops of a spherical shape will be treated briefly in this paragraph for the sole purpose of greater clarity and completeness of the results reported in this paper.

G. Mie has developed an algorithm [B.1] to evaluate the individual scatter of spheres of any material whatsoever at any frequency whatsoever.

For our specific interests the theory has been developed for spherical drops of rain at the F.U.B. [Fondazione Ugo Bordoni] [B.2]; the scatter functions in the "forward" direction have been evaluated from:

$$5(c) = \frac{10}{\sqrt{2}}(2n+1)(an+0n)$$
 (1)

and the corresponding sections of extinction and phase displacement [B.2]:

$$C_{s}(D) = \frac{\lambda^{2}}{\Pi} R_{e} \sum_{n=1}^{\infty} \frac{1}{2}(2n+1)(a_{n}+b_{n})$$
(2)
$$C_{s}(D) = \frac{\lambda^{2}}{\Pi} I_{m} \sum_{n=1}^{\infty} \frac{1}{2}(2n+1)(a_{n}+b_{n})$$

In (2) D is the diameter (in mm) of the drops of rain taken into consideration, λ is the wavelength (in cm), and a and b are the so-called coefficients of Mie.

The specific attenuation and phase displacement have been determined by using the extinction and phase section [B.2]:

$$A_{s} (dB/Km) = 4.34 \cdot 10^{-3} \sum_{k} C ext (D_{i}) \cdot N(D_{i})$$

$$F_{s} (grad_{i}/Km) = \frac{90}{11} \cdot 10^{-3} \sum_{k} C_{s} (D_{i}) \cdot N(D_{i})$$
(3)

Every term in the preceding summations is the product of the extinction (or phase) section relative to drops of diameter D_i by the number of drops $M(D_i)$ contained in 1 m³ with diameters in the field of $D_i \pm \frac{\Delta}{2}$ with $\Delta D=0.5$ mm.

The number of spherical drops $N(D_1)$ is found by means of the equation:

$$\frac{1}{10} \frac{10^4}{10} \cdot \frac{P \cdot M^2 D I}{V^2 D I \cdot D^2}$$
(4)

in which R(nm/h) is the intensity of precipitation, $M(D_i)$ [B.3] is the fraction of the total volume of rain due to drops with diameters in the field of $D_i + \frac{AD}{2}$, and relative to the predetermined value of R, V(D_i) in m/sec is the terminal falling velocity of the drops with diameter Di [B.4]. The $N(D_i)$ presented in Table 2 were calculated from the values reported in Table 1. Assuming Ray's water refraction index [B.5] at a drop temperature of 20°C, the values obtained from A_s (dB/Km) and F_g (°/Km) for 19 frequencies between 10 and 100 GHz are presented in Tables 3-11 and 12-20 as a function of R.

3. Rain Composed of Ellipsoidal Drops: T. Oguchi's Algorithm

In the case of simultaneous transmission of two electromagnetic waves at the same frequency with one polarized rectilinear lead in the vertical direction and the other in the horizontal direction, experimental findings have demonstrated the existence of a difference in attenuation and in phase displacement between the two polarization directions [B.6].

The phenomenon cannot be explained with the simple physical model of spherical drops.

For this reason it has been assumed that the real form of the raindrops, rather than being spherical, can be assimilated to an ellipsoid of rotational symmetry with axes arranged along the vertical line.

This then entails the need of going into deeper study of the scatter of an individual ellipsoid. Such a study has been carried out by T. Oguchi [B.7] by way of three different algorithms. The one defined as the "Foint Matching Technique" has been implemented at F.U.B., since it offers the advantage, over the other two, of being applicable to electromagnetic diffusors of any form whatsoever provided that they have rotational symmetry.

This method determines the coefficients of a series development of spherical harmonics analogous in principle to those of Mie, with the difference that, since in this case the diffusor is not spherical, the variable spherical harmonics are not decoupled: i.e., a definite spherical harmonic present in the incident wave is not limited to stimulating only the corresponding spherical harmonic in the diffuse wave, but stimulates a whole set of them coupled with it, in addition to stimulating spherical harmonics in the diffuse wave without any corresponding ones existing in the incident wave.

Actually, the generic component of the electromagnetic field can be expressed as a function of the spherical harmonics which satisfy Maxwell's equation [B.8]; all of the harmonics can be regrouped into two families, a and b, each with two degrees of freedom, m and n.

The "point matching technique" is based on the finding that the special rotational symmetry of the problem guarantees that all of the harmonics of a different index m are decoupled from one another. This means that the harmonics can be regrouped into families characterized by the same index m, including harmonics coupled to one another by the various values of n.

All of this considerably simplifies the problem, and in fact if N is the number of harmonics to be given consideration, it turns out that the two indices, m and n, vary from one another:

з К

<u>a ≤ m ≤ N</u> (=≠0) m ≤ b ≤ N

Each m family therefore has N-m+1 unknown harmonic amplitudes, and therefore 'requires N-m+1 independent equations [B.8].

Since there are four successive equations for the contour of the drop (two tangential components of E and two of H) for N = 14, in the worst case 4x14=56 independent equations are necessary, requiring N-m+1 points for the contour of each for applying the four successive conditions of the fields. In practice the symmetrical diffusor is divided into N-m+1 touches (Figure 1).

The solution of the systems of equations referred to allows the "forward scattering function" to be found (or advance diffusion) S_{II.I} (o) along the two directions I and II shown in Figure 1. As already seen for the spherical drops, these functions are indispensable for the calculation of attenuation.

The values for $S_{II,I}$, (o) calculated at F.U.B. at the frequencies presented in Table 3 and successive ones are presented in Tables 21-39 as a function of the various diameters of the spherical drops equivalent to the ellipsoidal ones with semiaxes a and b and eccentricity ϵ .

4. Specific Phase Displacement and Attenuation Along the Principal Planes

The transition from individual scatter functions to attenuation and phase displacement, due to a medium composed of a discrete number of diffusors, is not immediate. As a matter of fact, the bonds between the fields and material defined by the equation $\vec{D} = c \vec{E} \cdot \vec{B} \cdot \vec{u} \cdot \vec{J} = \vec{\sigma} \cdot \vec{\xi}$ are immediate in the case of "continuous" media and not granular as in the present case.

The difficulty has been overcome with the criterion of the equivalent of V. De Hulst [B.9], in which the equivalent is postulated between a dielectric layer and a layer of the same thickness of spherical diffusors.

Such a layer is presumed to be indefinite and transverse to the direction of propagation of a uniform plane wave [B.10]. The problem consists of determining the equivalent dielectric constant to be attributed to the dielectric, so that the mean radiation toward an observation point outside of the layer (Figure 2) proves to be equal to that which would exist at the same point with a real medium. The solution of the equivalence is given by [B.12]:

where \tilde{m} is the complex refraction index of the medium (almost equal to 1). S(o) is the "forward scattering function" (presented in Tables 21-39 for the two directions of interest to us), K_c is the propagation constant in free space. From this there is a direct transition to the propagation constant of a medium composed of a set of spherical diffusors given by:

$$\mathbf{\mathcal{T}} = \frac{2\mathbf{T}}{\kappa_0^2} \cdot \mathbf{\mathbf{\Sigma}} \quad \text{SI(0) N(D_1)}$$
(5)

in the real case of ellipsoidal drops, assuming all of the drops to have rotational axes in the transverse plane, defining the plane yz as the first principal plane (I) and the plane xy as the second principal plane (II) (Figure 1). Thus we can apply (S) along the two principal planes: (the index of the wave transmitted normally on the transverse plane, $\theta = 90^{\circ}$)

$$\boldsymbol{\mathcal{Y}}_{1,1} = \frac{\sum_{i=1}^{n} \sum_{j=1,1}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{i=1,2}^{n} \sum_{j=1,2}^{n} \sum_{i=1,2}^{n} \sum_{i=1,2}^{n$$

The application of (6) is based on an equivalence between the volumes of the ellipsoidal and spherical drops represented by means of [B.7]:

$$\frac{4}{3} = a = b^2 + \frac{4}{3} = b^{3/13}$$

$$\frac{3}{5} = a + b^{-1}/4.5^{1-3/2+1}$$

The values calculated for $A_{II,I} \xrightarrow{R_{r}} (\mathcal{Y}_{I,I})^{t}$ and $f_{II,I} \xrightarrow{I_{r}} (\mathcal{Y}_{II,I})^{t}$ by means of $S_{II,I}$ presented in Tables 21-39 and the $N(D_{i})$ of Table 2 are presented in Tables 3-20. Ray's refraction index at the temperature of 20°C is also used in this case.

5. Propagation of Radiowaves in Generic Polarization

The hypothesis of equioriented drops inclined with respect to the verticals, suggested by depolarization measurements, introduces a need to consider an inclination angle parameter " Φ " in the model propagating the electromagnetic waves [B.10]:

Since the state of polarization of an electromagnetic wave can be completely described by means of two special parameters "" α " and " ψ " [B.11], the need arises to represent the propagating channel in a complete way, either from the physical viewpoint by means of the parameter ϕ and the propagation constants $\gamma_{II.I}$, or from the electromagnetic viewpoint by means of the parameters " α " and " ψ ".

The complete representation as a function of the parameters referred to is given by the matrix expression [B.11]:

$$\begin{vmatrix} E_{1} & \text{out} \\ E_{2} & \text{out} \end{vmatrix} = \frac{\underbrace{\delta_{11} + \delta_{1}}{2} \cdot \underbrace{\ell}_{2}}{e} \cdot \left\{ Ch\left(\underbrace{\frac{\delta_{11} - \delta_{1}}{2} \cdot \ell}_{2} \right) \| U \| + Sh \frac{\underbrace{\delta_{11} - \delta_{1}}{2}}{2} \| Q \| \right\} \begin{vmatrix} E_{1}, \text{inc} \\ E_{2}, \text{inc} \end{vmatrix}$$
(7)

ORIGINAL PAGE IS OF POOR QUALITY in which $\gamma_{II,I}$ are the propagation constants described above, ε is the connection length in Km, ||u|| is the unit matrix, ||a|| is a matrix taking into account the state of polarization of the wave and of the angle of inclination of the ellipsoids, the terms of which are expressed by [B.11]:

Table 40 represents the values to be attributed to α and ψ to obtain some special types of polarization of the electromagnetic waves which are of interest in practice.

For the case of rectilinear polarizations, the values calculated by (7), with the hypothesis that $\Phi = \sigma$, coincide with the values given in Tables 3-11 for attenuation and Tables 12-20 for the phases. However, we can affirm that if the angle Φ is limited to a few degrees, the values found for A_{II.I} and B_{II.I} can now be considered valid.

Considering circular polarization, the values of α and ψ in Table 40 introduced in (7) tend to affirm that the attenuation and phase displacements in left circular polarization are equal to those in right circular polarization, and that both polarizations are independent of the angle of inclination of the drops.

It is known from (7) that the value of the attenuation and of the phase displacement in circular polarization can be conveniently expressed as the sum of a mean contribution (equal to the arithmetic mean of attenuation and phase displacements for $\phi = \sigma$), and a variation given by the model and argument of:

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The values of the mean $A_{M} = \frac{A_{II} \cdot A_{I}}{2}$ of attenuation A_{c} and phase displacement F_{c} are presented in Tables 3-20 at the frequencies previously given consideration.

6. Propagation with Inclined Axes

The case of earth-space propagation of electromagnetic waves in rectilinear or circular polarization can be treated in analogy with what has been said in the previous paragraphs.

In the case of terrestrial radioelectrical connections, the direction of incidence of the transmitted wave is normal to the transverse plane (Figure 1; $\theta = 90^{\circ}$) and, if we wish to consider inclined connections, it is sufficient to vary the angle of incidence θ to obtain the values of the propagation constants $\gamma_{II,I}(\theta)$, through the calculation program available in F.U.B. As an indication Table 41 presents the values of ($\gamma_{II} - \gamma_{I}$) for three possible angles of inclination relative to waves transmitted in rectilinear polarization along the two principal planes of rain precipitation.

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- B.2 Calculations of Attenuation and Phase Displacement Per Unit of Length Due to Rain Composed of Spherical Drops
- B.8 Models to Calculate Attenuation and Cross-Polarization Due to Rain.
- B.10 Attenuation and Depolarization in Tropospheric Propagation at , Frequencies Above 10 GHz.

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- B.11 Calculation of the Bonds Between Attenuation and Precipitation Intensity for Various Kinds of Polarization.
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Figure 1

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Table 1. Distribution of the Diameters of Drops as a Percentage of the Total Volume of Water (Laws - Parsons)

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Table 2. Number of Drops Contained in One m^3 of Precipitation as a Function of Their Diameter

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9°04	.27396+uil	.25454.0P	10+10+2*	.2648/.00	.26712+00
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Table 3. Values of Attenuation (dB/Km) at Precipitation Intensity R=.25(mm/h)

-14263-88 .28945.80 . 38672+80 .42199-01 21 U 87 + 8 A ヨヨ・フィオトチョ .64181.00 .7435+68 111798.41 .12226+01 .12620.01 12925+01 10-27551. 2 • 2=846+00 28651.00 31499.00 .47167.00 .571HU+U0 .67437.08 . 85364.00 .1093/01 14210.00 00-52656 .10202+01 11567-41. 12077.01 12475+01 12785+01 4224/-01 U-21010. 12444-01 AC A .14208+00 •47168•60 00++41/¢. (0.1/648. 42240-01 10-14008. .20844+00 .24630-00 • • 7 u + 2 • 0 0 .76440+00 93937+00 .10203.01 12476.01 .10935-01 .12078.01 12491-01 .11568.01 12780.01 u juv .13440.00 .19664.00 35306.00 .26964+30 44473+01 ./2803.60 90.032.01 11/16-01 10-0+66E. .82134-01 .54058.04 .63609.01 61540.03 10.95301. 11174.01 12120.01 12.00711. 12453+01 ľ .445.55-01. .14976+01 .22025+00 -3-08CHC. .39692+08 .49804.00 .89158.00 . 47643+00 11-1-11. UU+UICO0. .70480+UU19403-01 .12932-01 1.1266-01 11340+01 11962-01 .12456+01 10.91161. 20.6 **35.**U 0.00 10.0 15.0 25°U 30°U 40.0 65°0 70.0 **00**,00 FIUHZ) 95.0

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Table 4. Values of Attenuation (dB/Km) at Precipitation Intensity R= 1.25(mm/h)

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10.1 .31767-01 .27613-01 .276901 .297701	F (GHZ)	. !v	4	A.11 L	A.C	A V	
27.0 10.1757.0 10.1328.0 10.1428.0 10.1257.0 10.1428.0 27.0 20.4577.0 10.1757.0 10.1328.0 10.1428.0 10.4428.0 27.0 20.4577.0 10.1757.0 10.1328.0 10.4428.0 10.4428.0 27.0 27.65.0 2660.00 26665.0 5685.0 10.4278.0 10.4428.0 27.0 27.75.0 27.75.0 10.4278.0 10.4278.0 10.4579.0 27.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.7 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.7 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.75.0 27.		19-27-12	2 2 4 1 1 - 1 1	1 4 - 30 4 5 5 1	10-20/20	14-76592.	
20.457:00 .28855.00 .10179.01 .19328.00 .19328.00 .19328.00 35<0				- 78-51-51	(コーンシャカケー	11-10-14	
25.0 30757+00 50757+00 50757+00 50757+00 50757+00 35.0 67153+00 55640+00 51476+00 56470+00 64776+00 35.0 67757+00 55640+00 55660+00 55660+00 57660+00 64776+00 35.0 61795+00 55640+00 55640+00 55640+00 75749+00 76770 40 10045+01 716700 79749+00 79749+00 79749+00 79749+00 50.0 10570+01 11677+01 11677+01 11677+01 11729+01 77749+01 50.0 115660+01 11771+01 11677+01 117749+01 11777-01 11777-01 50.0 11672+01 11771+01 11771-01 11772-01 11772-01 11777-01 50.0 116666+01 11771+01 11771-01 11772-01 11772-01 11772-01 50.0 116666+01 11771+01 11772-01 11772-01 11772-01 11772-01 50.0 116666+01 11774+01 11774-01 11774-01 11779-01 11779-01 50.0 11710+01 11710+01		20457:00	10199.01	14328.00	111.566.1.		
39.0 47.53.00 47.400 49.278.00 46.743.00 47.400 39.0 37.50000 5569000 560739.00 597.45000 597.4500 40.0 11.77000 597.6500 76.7000 76.7000 76.7000 40.0 11.67700 597.600 76.7000 76.7000 76.7000 40.0 11.67100 76.7000 76.7000 76.7000 76.7000 40.0 11.67100 76.7000 76.7000 76.7000 76.7000 40.0 11.671000 11.770000 76.7000 76.7000 76.7000 50.0 11.671000 11.77000 11.77000 76.7000 11.77000 50.0 1.571000 1.671000 1.771000 1.771000 1.7723000 79.0 1.741700 1.741700 1.775000 1.7947700 1.7947700 79.0 1.741700 1.741700 1.775000 1.7947700 1.7947700 79.0 1.741700 1.775000 1.7947700 1.7947700 1.7947700 79.0 1.775700 1.775700 1.7947700 1.7947700 <t< td=""><td>25</td><td>32660.00</td><td>- 28855 · u +</td><td>.34757+01</td><td>10.20200</td><td>110.84A17.</td></t<>	25	32660.00	- 28855 · u +	.34757+01	10.20200	110.84A17.	
35.0			[.44278-04			
45.0 .100005.00 .7685.00 .76419.00 .76419.00 55.0 .100005.01 .88762.00 .47570.01 .47570.01 .4750.01 56.0 .11071.01 .11071.01 .11213.01 .4750.01 .41470.01 56.0 .115663.01 .12560.01 .1770.01 .11213.01 .44017.01 57.0 .15668.01 .12560.01 .17571.01 .17410.01 .14461.01 .14461.01 79.0 .15668.01 .15560.01 .16456.01 .17416.01 .17410.01 .17410.01 79.0 .15668.01 .15714.01 .17412.01 .15713.01 .17410.01 .14461.01 .14461.01 79.0 .15666.01 .16466.01 .17412.01 .15713.01 .17410.01 <t< td=""><td></td><td></td><td>.55840.04</td><td>.54733.04</td><td>. 35.45.10</td><td></td></t<>			.55840.04	.54733.04	. 35.45.10		
50 10845.01 80/62.00 94606.00 11214.01 11214.01 50 11671.01 12563.01 11271.01 11214.01 11470.01 55 11671.01 12563.01 12671.01 12401.01 14401.01 55 11671.01 12671.01 12401.01 14401.01 14401.01 56 11506.01 11576.01 11740.01 14401.01 14401.01 57 11506.01 11576.01 12730.01 14401.01 14401.01 75 11506.01 11576.01 11740.01 14401.01 14401.01 14401.01 75 11676.01 11676.01 11741.01 11741.01 1741.00 1741.00 75 11966.01 11076.01 11076.01 11741.01 1773.00 17440.01 75 110176.01 110176.01 110176.01 11440.01 17440.01 17440.01 75 110176.01 10126.01 10126.01 10126.01 11440.01 17440.01 70 20737.01 20126.01 20126.01 21747.01 21440.01 21440.01 <			. ; ; A55 • u I)	./6825+0n		-7H114.8U	
50 0 .11071-01 .11070-01 .11214-01 .111214-01 55 0 .13568+01 .12671-01 .12671-01 .12671-01 .12601-01 65 0 .15068+01 .12671-01 .12671-01 .12601-01 .140017-01 79 0 .15068+01 .16716+01 .16716+01 .140017-01 .140017-01 79 0 .15068+01 .16716+01 .1745001 .1745001 .1745001 79 0 .17417+01 .16176+01 .17174-01 .1745001 .177238-01 79 0 .17417+01 .16176+01 .17174-01 .1745001 .1746001 79 0 .10176+01 .17174-01 .17174-01 .1745001 .1746001 79 0 .20176+01 .20176+01 .17174-01 .17400-01 .21047701 79 0 .20176+01 .21756+01 .21774-01 .21040-01 .21040-01 70 .21516+01 .21755+01 .21756+01 .21516+01 .21940-01 .21940-01 81 .21555+01 .21755+01 <		10445+01	88762+JJ	. v4616.01	10.57646.		
55 1.1263+01 1.2162+01 1.2671+01 1.2645401 1.4361+01 1.4461+01 1.46617+01 65 1.5668+01 1.5668+01 1.5715+01 1.4361+01 1.4561+01 1.46617+01 1.4561+01 1.4561+01 1.4561+01 1.45617+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4561+01 1.4723+01 1.4723+01 1.4723+01 1.4761+01 2.1476+01 2.14760+01 2.1476		1187.01	.10570.01		11213001	. 11476+01	
65 0 .15068.01 .135060.01 .14364.01 .14361.01 .144617.01 75 0 .15713.01 .15713.01 .15713.01 .15713.01 .15713.01 75 0 .17473.01 .15715.01 .16423.01 .15713.01 .15713.01 75 0 .17457.01 .16456.01 .16713.01 .17473.01 .17466.01 75 0 .19669.01 .16774.01 .161754.01 .17473.01 .17460.01 75 0 .19669.01 .17474.01 .19176.01 .19467.01 .10447.01 76 0 .20737.01 .19176.01 .19177.001 .19467.01 .19467.01 76 0 .20127.01 .20126.01 .20127.01 .21947.01 .21947.01 70 .2152.01 .21316.01 .21314.01 .21970.01 .21970.01 70 .2157.01 .21735.01 .21735.01 .21735.01 .21735.01		10+09521	.12182.01	-12A71-01	10.00421.	14+0151.	
65.0 .16423.01 .15000000 .1501000 .1501000 .1501000 .1501000 .1501000 .1501000 .1700000 .1723800 75.0 .1767000 .1741000 .1741000 .1741000 .1712000 .1723800 .1723800 75.0 .1766000 .1741000 .1717000 .1717000 .1740000 .1740000 .14400000 .14400000 .14400000 .14400000 .14400000 .14400000 .14400000 .14400000 .14400000 .14400000 .14400000 .14400000 .144000000 .144000000 .144000000 .144000000 .144000000 .1440000000 .144000000 .144000000 .1440000000 .14400000000 .1440000000000000 .1440000000000000000 .14400000000000000000000000000000000000		15068+11	110001.	["•**2*1.	.14361.01	.14017.01	
76.0 17474.0 174258.0 16466.0 101266.0 174123.0 75.0 100633.0 17417.0 10126.0 10126.0 10129.0 75.0 100633.0 17417.0 10126.0 10126.0 10129.0 80.0 10063.0 17417.0 10126.0 10126.0 10126.0 80.0 10063.0 17417.0 101270.0 101270.0 10447.0 81.0 10063.0 101270.0 101270.0 10447.0 10447.0 81.0 20733.0 101270.0 10126.0 20127.0 10447.0 81.0 20733.0 201270.0 20126.0 20127.0 20127.0 81.0 21412.0 21730.0 21567.0 21570.0 21570.0 82.0 2100.0 2110.0 21575.0 21575.0 21575.0 21575.0		16423+11	1	13.5/16.01	[].].].].	.1541.01	
75 0		12474+41	.1.258.0]	.16965.01		. 27238.01	
80 8 1.9176.01 1.9176.01 1.9176.01 1.9447.01 85 0 20733.01 1.9379.01 1.9379.01 2.0331.01 2.0437.01 2.0437.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0447.01 2.0131.01 0.01 2.0131.01			10.1421.	10126.61	[]+[/[]].	10.50447.	
05.0 .20735.01 .103/9.4 .24.56.01 .24.054.01 .27.031.01 01.0 .21412.01 .20122401 .201767.01 .21705.01 .21030.01 05.0 .21922.01 .20122401 .201316.01 .21316.01 .21319.01 05.0 .21922.01 .2104041 .21316.01 .21316.01 .21539.01 01.0 .22101.01 .21109.01 .21536.01 .21534.01 .21536.01		1986.4	1.4.7.4.1.	. 19170+01	1916/19101.	19447.01	
90.6 .21412+01 .20122+01 .24767+01 .21036-01 .21036-01 .21576-01 <th .21<="" td=""><td></td><td>20703-01</td><td>11.97.601</td><td> 56 . 01</td><td>.20054+01</td><td>10.16605.</td></th>	<td></td> <td>20703-01</td> <td>11.97.601</td> <td> 56 . 01</td> <td>.20054+01</td> <td>10.16605.</td>		20703-01	11.97.601	56 . 01	.20054+01	10.16605.
95.6 .21922.01 .21316.01 .21314.01 .21574.01 .21574.01 .21574.01 .21574.01 .21574.01 .21575.01 <th .21<="" td=""><td></td><td>21412+11</td><td>29122+01</td><td>. 24767.01</td><td>10.20/02.</td><td>210.00.01</td></th>	<td></td> <td>21412+11</td> <td>29122+01</td> <td>. 24767.01</td> <td>10.20/02.</td> <td>210.00.01</td>		21412+11	29122+01	. 24767.01	10.20/02.	210.00.01
200.0 .22301.01 .211A9.41 .21735.01 .217.44.01 .217.44.01 .2198.3.01		21022+41	2473 4+ 41	11191812.	[n + [f 2 .	19.07615.	
	149.6	.22301.01	.21169.11	11335.01	.21/34+#1		

Table 5. Values of Attenuation (dB/Km) at Precipitation Intensity R= 2.50(mm/h)

ORIGINAL PAGE IS OF POOR QUALITY

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f (ŭ11 Z J	115	-	Anl v	A C	45
	[= + + + + + + + + + + + + + + + + + +	.6/82 - 41	./7535-41	19-4257.	[R=76P2/"
		1210.00	.27699.01	uu+11/22,	.22639+05
		102 T T + 40	10+2+244	00.14524.	39+56+24.
5		2007 Z + 10	. 65018.00		
		BSSUJ + US	50.800XA.	99-54927.	
		1	12750+01	.17246.01	.12476+01
		1.4704.	115301.01	10.17.01.	.15694.81
		17297.41	14503.41	.1N496.01	.14891.81
		11.0,112.	11409-12.	11.0012.	
		10.1002	.21135.01	10+65195.	.24622+01
		251,0.43	10.02.01	.26429+01	.26949+01
	207/0+01	10.72152.	-28431•U1	.24422+03	.28750+01
		28-44+4]	Lu+6nZuC.	10. 40102.	12.02.07.
		1 5:400.	TU-L'ALL.		10+35767.
		.32054.01		10.0555.	17+19/07.
		Intleft.	. 34465.01	13・セムチャッ・	10・7と3キフ。
	36414+01	1, * · · · · FD.	.35422+01	[]+/[+45.	13・18357。
		.35125.et	13.43.43.01	13・44167。	
	37643+1	.35738.01	.36642.61	17920.	19+15176.
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Table 6. Values of Attenuation (dB/Km) at Precipitation Intensity R= 5.00(mm/h)

16.0 25592.00 21940.00 21940.00 67163.00 67240.00 21940.00 26.0	F (GHZ)	. IIV	A 1	AME U	AC.	7 4
10.0 .25592.00 .21947.40 .23970.00 .24011.00 .23004 26.0 .12535.01 .07235.01 .07230.00 .0673334 26.0 .10731.01 .1175.01 .117540.01 .117540.01 .117540.01 26.0 .1973.01 .1071.01 .17540.01 .24101.01 .17540.01 .17540.01 26.0 .1975.01 .22457.01 .17555.01 .24101.01 .24057.01 .175697.01 26.0 .3657.01 .26470.01 .27557.01 .37555.01 .24470.01 .24657.01 36.0 .3657.01 .3657.01 .3757.01 .37470.01 .24657.01 .24657.01 36.0 .3557.01 .3757.01 .3757.01 .376557.01 .24657.01 .24657.01 36.0 .9144.01 .35572.01 .35572.01 .376557.01 .24657.01 .24657.01 56.0 .956.230.01 .95672.01 .97649.01 .97657.01 .97657.01 .24657.01 57.0 .95672.01 .97649.01 .97670.01 .97679.01 .97667.01 .97667.01 56.0 .97649.01 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td></td<>						
15.0 .72632.00 .67255.00 .67103.00 .67250.00 .12755.00 .11755.00 20.0 .12640.01 .12755.01 .12755.01 .17590.01 .11755.01 25.0 .10930.01 .12041.01 .12755.01 .17590.01 .11755.01 25.0 .10930.01 .1204.01 .17590.01 .17590.01 .17590.01 25.0 .10931.01 .2405.01 .24111.01 .2747.01 .2465.01 36.0 .10931.01 .2405.01 .2745.01 .2745.01 .2465.01 3747.01 .2745.01 .2747.01 .2745.01 .2465.01 .2747.01 3747.01 .3747.01 .3747.01 .2465.01 .2745.01 .2465.01 3747.01 .3745.01 .3747.01 .3747.01 .2465.01 .2465.01 3747.01 .3745.01 .3747.01 .3747.01 .2465.01 .2465.01 374 .00000.01 .3747.01 .3747.01 .3465.01 .2465.01 374 .0101.01 .3747.01 .3747.01 .3465.01 .2465.01 374 .01000.01 .3747	n • 0 T	.25492+44	-21940.ull	.23970-00	.24411.04	07+69972*
20.0 .12640401 .10774401 .11755401 .1175540 25.0 .199730401 .10041401 .17535401 .1753540 25.0 .26103401 .16041401 .17535401 .1753540 39.0 .26103401 .22439401 .2411101 .1753540 39.0 .26103401 .22439401 .23455401 .1753540 39.0 .39475401 .22439401 .2741101 .274701 39.0 .39475401 .31935401 .31935401 .319367 39.0 .39475401 .37511401 .31947401 .37512401 39.0 .39604401 .37512401 .31755401 .34657401 59.0 .39679401 .37512401 .573212401 .3996791 59.0 .36573401 .573212401 .5573401 .3996791 59.0 .365736401 .5747401 .5573401 .5732401 59.0 .36574401 .5747401 .5574001 .59674501 59.0 .36745401 .5747401 .5574001 .59674201 59.0 .36745401 .5767401 .5767401	15.0	.72632+06	• 62294 • u ll	.67163.0N	.67240.08	
25.0 .19930.01 .16041.01 .17535.01 .17540.01 .17640.01 .17660.01 30.0 .26103.01 .22039.01 .23055.01 .17560.01 .24101.01 .24007.01 .24057.01 35.0 .33475.01 .2755.01 .30555.01 .37514.01 .24067.01 .240901.01 .4409.01 .4409.01 .4409.01 .4409.01 .44067.01 .44067.01 .44067.01 .44067.01 .44067.01 .44067.01	20.0	.12641.01	• 1U771+ul	.11715.01	11725+01	10+90/11.
30.0 .26103.01 .22439.01 .2945.01 .21010 .21070 35.0 .33475.01 .28459.01 .30955.01 .30960.01 .31070 40.0 .4150.01 .37511.01 .37470.01 .37650 40.0 .40572.01 .37511.01 .47570.01 .409670 55.0 .46531.01 .40572.01 .47514.01 .475670 55.0 .56230.01 .40572.01 .47514.01 .475670 55.0 .56230.01 .40572.01 .5772.01 .409670 55.0 .56230.01 .56732.01 .56734.01 .5767401 55.0 .56230.01 .55672.01 .57674.01 .5767401 .5767401 56.1 .56230.01 .56737.01 .57674.01 .5767401 .56745.01 .5767401 56.1 .56747.01 .57674.01 .57147.01 .52112.01 .56749.01 .56749.01 57.0 .5674.01 .574701 .57147.01 .52112.01 .574701 .5712.01 .5712.01 .57147.01 .56740.01 .56740.01 .56740.01 .56740.01 .56740.01 .	25.0	10.02001.	.16041.41	.17535.01	.17540+41	LJdn5.Ul
55.0 .33475+01 .244000+01 .3645+01 .3747001 .4667+01 .346000101 .46671 .346000101 .46671 .37470001 .466701 .37470001 .46671 .46671 .54600101 .57470001 .466701 .46986701 .46986701 .46986701 .46986701 .46986701 .46986701 .46986701 .46986701 .46986701 .46986701 .46986701 .674761 .6674701 .66740701 .7666701 .7666701	305	.26103-01	.22439+41	.24111.01	.24101+01	.24621+41
40. -44551.01 -37511.01 -37470.01 -47654.01 45.0 -46531.01 -45772.01 -45718.01 -47365.01 55.0 -56230.01 -45772.01 -45772.01 -47518.01 -47365.01 55.0 -56230.01 -556745.01 -556745.01 -56436.01 -59457.01 -59457.01 55.0 -56230.01 -556745.01 -556745.01 -556745.01 -59457.01 -59457.01 56.1 -56436.01 -556745.01 -556745.01 -556745.01 -59457.01 -59457.01 67.1 -556745.01 -556745.01 -556745.01 -556745.01 -59457.01 71.1 -55674.01 -55674.01 -556745.01 -556745.01 -59457.01 71.1 -67457.01 -55674.01 -556745.01 -56745.01 -56745.01 71.1 -67457.01 -67274.01 -52440.01 -52440.01 -52440.01 -556745.01 71.1 -67457.01 -67274.01 -67274.01 -659440.1 -659440.1 -65941.01 -65742.01 80.0 -101.0 -67270.01 -67270.01 -657	15.0	.33475+41	.24352.31	10+35966.	10.0000.	10+24015.
45.0 .46531.01 .40505.01 .43518.01 .43467.01 .43467.01 55.0 .56530.01 .45772.01 .45772.01 .47510.01 .4731.01 55.1 .56530.01 .556740 .53212.01 .54434.01 .54434.01 56.1 .56630.01 .556740 .556745.01 .54434.01 .56649.01 .556745.01 .54434.01 57.1 .56745.01 .556745.01 .556745.01 .54434.01 .56745.01 .54434.01 57.1 .56745.01 .556745.01 .556745.01 .54434.01 .56745.01 .54434.01 75.1 .662436.01 .556745.01 .56745.01 .56745.01 .56745.01 75.1 .667374.01 .67472.01 .56745.01 .56745.01 .600891.0 79.1 .667374.01 .67472.01 .67472.01 .659667.01 .659667.01 .659667.01 71058.01 .71678.01 .667274.01 .67472.01 .67472.01 .659677.01 .67427.01 80.0 .71678.01 .71017.01 .67010.01 .6727.01 .67472.01 .79040.01 .79487.1 <td< td=""><td>40.0</td><td>[]+[]]]+[]</td><td>. 34000 - 4</td><td>.37511+01</td><td>10.07475.</td><td>19+29445.</td></td<>	40.0	[]+[]]]+[]	. 34000 - 4	.37511+01	10.07475.	19+29445.
59.0 .918484401 .45722401 .48789501 .48731401 .49967401 55.0 .56230401 .56149401 .53212401 .543340 .5443401 56.1 .56230401 .5567401 .53212401 .5443401 .5443401 67.1 .5674501 .55674101 .55674501 .5443401 .5445401 .5475401 .5475401 .5445401 .5475401 .5475401 .5475401 .5475401 .5475401 .5475401 .5475401 .5475401 .5475401 .5475401 .54752401 .65745401 .65745401 .6544801 .65745201 .6544801 .6554801 .65745201 .65968010 .6554801 .65745201 .65968010 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65966201 .65745201 .65745201 .65966201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .65745201 .769005001 .71462201 .7	45.0	.46531+01	.40505•ul	.4.1518.01	.4346/+01	.44612+05
55.8 .56230.01 .50109.01 .56791.01 .52112.01 .60691.01 79.1 .64754.01 .61854.01 .671857.01 .52112.01 .61892.01 .65948.01 79.1 .64754.01 .671857.01 .67372.01 .65948.01 .67372.01 .65948.01 79.1 .70068.01 .67372.01 .67472.01 .79040.01 .7904.01 .7948.71 .7948.71 .7949.71 .7949.71 .7949.	0.65	10+4444.	• 45722•Ul	10+68584.	.447.51.01	.49967.81
60.8 596687411 556745401 56745401 56745401 560914 65.6 62435441 5595441 559649401 59649401 59649401 506914 76.1 64754441 5954441 6737441 52112401 5034444 76.1 64754441 618544441 67374401 67374401 60544844 75.4 64754441 618544441 67374401 67374401 6737441 75.4 70684441 67374411 67374401 6737441 6732241 85.0 70684441 67374411 6747441 674741 6732241 85.0 71074441 67414441 674741 6746241 7049441 85.0 71973441 67414441 67414441 6746241 70462441 85.0 71973441 704441441 70444441 71453444 71453444	55.8	.56230.01	10440104.	.53212.01	14.03152.	
05.6 .62436.01 .5494.01 .59649.01 .59649.01 .60001.0 7.6 .64754.01 .5954.01 .67147.01 .52112.01 .63354.01 7.6 .64754.01 .6134.401 .67370.01 .67370.01 .6334.01 .6334.01 7.6 .64754.01 .6134.401 .67370.01 .67370.01 .6544.41 .6544.41 7.6 .6747.01 .67370.01 .67370.01 .67372.41 .6544.41 .67322.44 86 .70684.01 .6747.01 .6747.01 .6747.01 .6747.01 .6747.22 87.0 .71684.01 .6747.01 .6747.01 .67487.01 .67487.01 .7948.40 85.0 .71684.01 .6747.01 .67487.01 .67487.01 .7948.20 .7948.20 96 .71673.01 .70001.001 .70004.01 .71637.01 .71639.01 97 .72578.01 .707122.01 .70704.01 .71639.01	2 ° °	-59688+HI	10+C285C.	.56791.01	.56745.41	.24016.81
7.0.11 .64754+u1 .5754+u1 .67147+u1 .52112+01 .63324+0 75.u .6470+u1 .6143+u1 .6437+u1 .65448+1 75.u .6470+u1 .6143+u1 .6437+u1 .65448+1 80.u .6410+u1 .6143+u1 .6437+u1 .65448+1 80.u .66411 .6437+u1 .65448+1 .65448+1 80.u .6641+u1 .656591+u1 .65423+01 .65747+1 .65747+1 85.u .7068+u1 .05591+u1 .67473+01 .67422+1 .67322+1 85.u .71679+u1 .05910+01 .67011+u1 .67014+01 .70405+u1 .70462+1 85.u .71673+1 .70119+01 .70104+01 .71632+1 .71632+1 84.u .72578+u1 .640045+1 .70712+u1 .70704+u1 .71639+1	05 . U	.62436+#1	10.44.44.	.54649+01	.59649+01	.60891+01
75.u .66805-u1 .61834-u1 .61834-u1 .65320-u1 .65484-u1 80.u .606207-u1 .6386-3-u1 .6672/2-u1 .65207-u1 .67322-1 80.u .006207-u1 .65591-u1 .6562/2-u1 .65227-1 .67322-1 80.u .70604-u1 .65591-u1 .67527-1 .67322-1 .67322-1 80.u .70604-u1 .65591-u1 .67121 .67422-1 .67422-1 .67422-1 80.u .71273-u1 .66705-u1 .67422-1 .67011-u1 .67462-1 .78462-1 91.u .71973-1 .70113-01 .70013-01 .78462-1 .78462-1 .78462-1 91.u .77122-01 .70732-01 .70732-01 .71639-01 .71639-01	10.07	.64754+01	. 5954001	.6714/+U1	.52112.01	18+22664
B0.8 .onfulled .onfulled .onforted	75.0		.61d34+u1	.6432u+01	.64290+01	.05448+U
U5.0 .70608-01 .05591-01 .07629-01 .07810-01 .07808-01 .078082-01 .70892-0 V0.0 .71973-01 .0040010 .070100-01 .70892-0 .70892-0 V5.0 .71973-01 .0640000 .700100-01 .70892-0 V6.0 .71973-01 .700000-01 .70807-01 .708062-0 V6.0 .71973-01 .70000000 .7080000 .7080000 V6.0 .71973-01 .70000000 .7080000 .7165000 V6.0 .72578-01 .06400000 .7165000 .7165000	202	10.14900,	10.505.0.	. 66232.01	.66207+01	.6732.61
V8.u V1178+U1 Convention Convention <thconvention< th=""> <thconvention< th=""> <</thconvention<></thconvention<>	85.0	.70008+01	.05591.01	.67829.01	.07810.01	
95.0 .71973+01 .68065+01 .70019+01 .70004-02 .79987+0 144.0 .72529+01 .64692+01 .70712+01 .70704+01 .71639+0	78°	.71178-01	[1]+CHVO.	IU.INUVO.	10+60960.	./0492401
144.0 .72528+41 .64649+41 .7712+81 .70704+81 .71639+1	45.0	.71973-01	68U65.JI	10+41007.	.70004.01	.79987.
	1.44.0	.72528+41	10.4040.	./0712+01	.70704•41	.71639+01

Table 7. Values of Attenuation (dB/Km) at Precipitation Intensity R = 12.50(mm/h)

ORIGINAL PAGE 10 OF PARE CHARTY

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10.0 .57935.00 .57935.00 .19562.00 25.0 .15704.01 .13350.01 .14552.01 .14562.01 20.0 .55704.01 .57935.00 .14552.01 .14552.01 26.0 .3005401 .57935.01 .14552.01 .14552.01 26.0 .3005401 .57935.01 .54370.01 .24370.01 27.0 .3005401 .57936.01 .14552.01 .14552.01 27.0 .3007010 .57936.01 .54370.01 .24370.01 27.0 .5527001 .57937.01 .54370.01 .7957.01 26.0 .700701 .7957.01 .7957.01 .7957.01 26.0 .700701 .7957.01 .7957.01 .7957.01 26.0 .1007011 .7957.01 .7957.02 .10077.01 26.0 .11677.01 .7957.02 .11077.01 .7957.02 26.0 .11677.01 .7957.02 .11077.01 .7957.02 26.0 .11677.01 .7957.02 .11077.01 .7957.02 26.0 .11677.01 .7967.01 .7957.02 .11077.01	(ZHD)}	- 14	14	A ME U	AC	54
10.0 .63013.00 .57657.00 .57935.00 .14552.00 20.0 .15704.01 .25272.01 .14532.01 .14552.01 20.0 .39059.01 .57359.01 .57356.01 .14552.01 20.0 .39059.01 .57359.01 .57356.01 .24349.01 20.0 .39059.01 .57357.01 .57356.01 .24349.01 20.0 .39059.01 .5272.01 .57356.01 .24349.01 20.0 .39059.01 .5272.01 .57356.01 .74349.01 25.0 .5272.01 .57459.01 .74562.01 .74562.01 25.0 .64477.01 .7959.01 .7957.01 .79552.01 25.0 .64477.01 .7959.01 .7957.01 .79572.01 25.0 .64477.01 .79579.01 .79579.01 .79572.01 25.0 .97457.01 .79579.01 .79579.01 .79579.01 25.0 .114577.02 .11477.02 .112770.02 .112770.01 25.0 .114577.02 .11477.02 .112770.02 .112770.02 25.0 .114577.02 .114777.02 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
25.0 1.5704.01 .13350.01 .14532.01 .14552.01 26.0 .265704.01 .37054401 .2717701 .2449401 .2434901 30.0 .26570401 .3705401 .2717701 .24370401 .24370401 36.0 .52270401 .37170701 .2437001 .2437001 .2437001 36.0 .52270401 .43297401 .2705701 .2437001 .270701 36.0 .52270401 .7007401 .700701 .702401 .702401 36.0 .64473401 .700447401 .702401 .7027401 .702401 36.0 .007401 .7007401 .7042401 .7027401 .70272401 36.0 .01355401 .70127401 .7052401 .70272401 .70272401 36.0 .0144701 .70127402 .10272402 .10272402 36.0 .114679401 .7023402 .10272402 .1027402 36.0 .11479402 .1127402 .1127402 .1127402 .1027402 36.0 .11479402 .1127402 .1127402 .1127402 .1127402	10.0	.63n13•u1	00+14924.	.57435+01	.5AlU4+UD	57155+0il
25.0 .25712**41 .2712**41 .35522*41 .37510*01 25.0 .39058*41 .43297*41 .35522*41 .4778/41 36.0 .5727*41 .9710*01 .35522*41 .4778/41 36.0 .5727*41 .97464*41 .7427*41 .4778/41 36.0 .5727*41 .94464*41 .7427*41 .77957*41 36.0 .5727*41 .94464*41 .7707*41 .7707*41 36.0 .5727*41 .94464*41 .7707*41 .7707*41 36.0 .6447*41 .7447*41 .7707*41 .7707*41 36.0 .0576*41 .7447*41 .7707*41 .7707*41 36.0 .0597*41 .7447*41 .7707*41 .7707*41 36.0 .0707*41 .7447*41 .7707*41 .7707*41 36.0 .01057*41 .7440*41 .7707*41 .7707*41 36.0 .11057*41 .7400*7 .11027*41 .7707*41 36.0 .11057*41 .7707*41 .7106*7*2 .1106*7*41 36.0 .11057*41 .7106*7*4*2 .1106*7*4*2 .1106*		15708+01	13350.01	.14532.01	.14562-01	145nd•U1
25.0 .39008401 .3729761 .4778561 .4778561 36.0 .52270401 .4329761 .4778561 .4778561 36.0 .5227041 .4329761 .4778561 .4770761 36.0 .5227041 .4329761 .4778561 .4770761 36.0 .5227041 .4427401 .7969261 .4770761 36.0 .6447341 .7487401 .7969261 .79592601 36.0 .795701 .74827401 .7969261 .79592601 36.0 .0 .79692701 .79692601 .79592601 36.0 .0 .10425401 .79562601 .79592601 36.0 .10425601 .79572601 .9756201 .9756201 36.0 .11275601 .79572601 .97572001 .9757200 36.0 .112756002 .11077002 .110252002 .10057002 36.0 .116457002 .11077002 .110677002 .110677002 36.0 .116457002 .11077002 .110677002 .10057002 36.0 .116457002 .111274002 .11067702 .11067		26570+41	22121.41	10+54542.	.24376.01	\$24621• 0 1
35 0 43297.01 47795.01 47707.01 45 0 64473.01 54660.01 79552.01 45 0 64473.01 7467.01 79552.01 45 0 79692.01 77597.01 775507.01 45 0 9759.01 779692.01 775507.01 45 0 10,355.02 97583.01 779692.01 97528.01 46 0 0 10,355.02 97583.01 97569.01 97569.02 47 0 0 10,355.02 97583.01 97569.02 10,679.02 106721.02 47 0 0 10,679.02 10,679.02 10672.02 10672.02 46 0 11,679.02 11,679.02 10672.02 10672.02 47 0 11,679.02 11,679.02 116672.02 10672.02 47 0 11,679.02 11,679.02 110672.02 10672.02 47 0 11,699.02 11,679.02 11067.02 10677.02 47 0 0 11,699.02 11067.02			14.2122.	.35622.01		1、・1のしょし。
35.0 64873.01 59464.01 79660.01 79532.01 45.0 76.007.01 79692.01 79547.01 79547.01 45.0 7967.01 79692.01 79507.01 79507.01 50.0 97592.01 79692.01 79507.01 79507.01 50.0 97907.01 81825.01 97528.01 97528.01 97528.01 50.0 10.355.02 10.41827.01 9756.01 97528.01 97528.01 97528.01 50.0 10.555.02 10.41827.01 10.234.02 10.6727.02 10.6727.02 51.0 11.6995.02 10.679.01 9758.01 9756.02 10.679.02 10.6727.02 50.0 11.266.02 10.679.01 10.702 11.677.02 11.677.02 11.677.02 10.677.02 50.0 11.675.02 11.677.02 11.677.02 11.677.02 11.677.02 10.677.02 50.0 11.675.02 11.677.02 11.677.02 11.677.02 11.677.02 11.677.02 50.0 11.675.02 11.677.02 11.677.02 11.677.02 11.657.02 10.677.02 <			10.0267.01	.47785-01	.477u7.01	10.00000
45 0		.64873+ul	1 + 4 4 4 4 4	10.0006.	.54532.01	10.2224.
45.0 65.362.01 74021.01 79.692.01 79507.01 50.0 97.2007.01 0.1825.01 0.47228.01 0.47228.01 55.0 97.001 0.1825.01 97.65.01 97.65.01 97.65.01 60.0 10.4725.02 0.1825.01 97.65.01 97.65.01 97.65.01 97.65.01 60.0 10.4755.02 10.4147.02 1.0725.01 97.65.02 1.0672.02 1.0672.02 70.0 11.255.02 10.4147.02 1.0725.01 97.65.02 1.0672.02 1.0672.02 70.0 11.266.02 11.075.02 1.1075.02 1.10672.02 1.10672.02 70.0 11.766.02 1.0679.01 1.0679.02 1.10672.02 1.10672.02 75.0 11.669.02 1.0679.012 1.1075.012 1.10672.02 1.10672.02 75.0 11.669.02 1.10679.02 1.10679.02 1.10672.02 1.10672.02 75.0 11.669.02 1.10679.02 1.10679.02 1.10679.02 1.10679.02 75.0 11.669.02 1.10679.02 1.10679.02 1.10679.02 1.10679.02 70.0		11-11-11-1	0484/+ul	10+72417.	10.44.207.	.72468.01
50 0 0722801 51 97290701 01182501 9755001 55 0 9100001 91825001 9465001 55 0 9100001 91825001 9465001 55 0 9100001 91825001 9465001 55 0 9100001 91825001 9465001 56 0 10725002 9758001 9465001 66 0 11075002 11072702 107270 75 0 1127402 11075002 11077002 75 0 11765002 11075002 11077002 75 0 11775002 11077002 11077002 75 0 11775002 11077002 11077002 75 0 11775002 11077002 11077002 76 0 11775002 11077002 11077002 70 0 11727002 11077002 11077002 70 0 11727002 11077002 11077002 70 0 117270002 11077002			74421.44	.79692.01	79507-01	10 • 60 A 18 *
55.0 98090001 94425401 94489901 94489901 65.0 10,55000 10,55000 10,55000 10,5700 65.0 10,55000 10,55000 10,5700 10,5700 65.0 10,55000 10,55000 10,5700 10,5700 75.0 11,75000 11,4600 10,5700 11,0570 75.0 11,24600 11,05700 11,05700 11,05700 75.0 11,75000 11,05700 11,05700 11,05700 75.0 11,05700 11,05700 11,05700 11,05700 75.0 11,05700 11,05700 11,05700 11,05700 75.0 11,05000 11,05000 11,05200 11,05200 75.0 11,052000 11,05200 11,05200 11,05200 70.0 11,052000 11,05200 11,05200 11,05200 70.0 11,052000 11,052000 11,052000 11,052000 70.0 11,052000 11,052000 11,052000 11,052000 70.0 11,052000 11,052000 11,052000 11,052000			10.02818.	. 47400.01	. 47228•01	.89766.81
00.0 10.55502 9352701 94489401 9435401 05.0 1075502 97580001 1022102 1022102 10.0 1175602 97580001 1055202 1065202 10.0 11766002 10407002 10552002 10672002 10.0 11266002 10407002 11072002 1106702 10.0 11660002 1067902 11067002 1106702 10.0 11766002 1067902 1162002 11726002 10.0 11705002 1162002 1162002 1162002 10.0 1192002 11320002 1162002 11672002 10.0 1192002 11320002 1162002 11672002 10.0 1192002 11320002 1162002 11672002 10.0 1192002 1152002 1162002 11622002 10.0 1192002 1162002 11672002 11672002 10.0 11902002 1162002 11672002 11672002			10-20-00-00-00-00-00-00-00-00-00-00-00-00	· V Sr. 5 · U]	. 43465+01	19.55933.61
65.0 11755600 1022102 1022102 75.0 1175602 1011102 1057202 75.0 1175602 1011102 1057202 75.0 1175602 1011102 1105202 75.0 114602 1011102 11052002 75.0 114602 1011102 11052002 75.0 114602 1007902 1106702 75.0 11460202 1007902 1106702 75.0 117602 11072002 1106702 75.0 11766002 11052002 1162002 76.0 11960002 11320002 1162002 70.0 1192002 1152002 1162002 70.0 1152002 1152002 1162002 70.0 1152002 1152002 1162002 70.0 1102002 1162002 11622002 70.0 1152002 1162002 11622002 70.0 1152002 1162002 11622002 70.0 1162002 1162002 11622002 70.0 1152002 1162002			[" + / Z + L	[1 + 6 H + 4 4 .	11.4.54%.	.10675+42
75.0 112469502 1011/02 14551.62 10654202 75.0 11246902 10414.02 10679402 10672.02 75.0 11246902 10414.02 11672.02 116672.02 65.0 11467.02 10479.02 11672.02 11672.02 65.0 11664.02 10779.02 11274.02 11274.02 65.0 11775.02 11067.02 11624.02 11674.02 95.0 11775.02 11224.02 11624.02 11672.02 96.0 11964.02 11328.02 11629.02 11672.02			97583•41	.10232.02	10221+02	.10459+82
75.0 11266.02 10414.02 10672.02 66.0 11467.02 10679.02 11067.02 65.0 11643.02 10679.02 11270.02 65.0 11673.02 11672.02 11270.02 65.0 11773.02 11067.02 11270.02 95.0 11773.02 11224.02 11429.02 96.0 11773.02 11623.02 11571.02 96.0 11960.02 11224.02 11629.02 96.0 11960.02 11524.02 11629.02		1 4 0 4 5 4 1 2	20.10101	50+ICCPI.	10542+02	.18759+02
60.0 11467442 10679462 11075402 110767402 110769462 65.0 11645442 10769462 11274402 11727442 11626402 95.0 117754402 11274442 11629402 11541402 11542402 96.0 119184642 11224402 11542402 11542402 11542402 140.0 11918462 11328402 115224402 11562402 11552402			-11414+02	50+65401.	. 10822+02	.11029.07
45.u .11645-u2 .10462-u2 .11274-u2 .11274-u2 45.u .11735-u2 .11065-u2 .11429-u2 .11426-u2 45.u .11755-u2 .11062-u2 .115426-u2 45.u .11916-u2 .11224-u2 .115426-u2 46.a .11918-u2 .11328-u2 .11623-u2			10079-112	.11.13.02	.11067.42	.11265+92
V0.0 .11773+U2 .11085+U2 .11429+U2 .11426+U2 V5.0 .11861+U2 .11273+U2 .11542+02 .11541+U2 V6.0 .11918+U2 .11323+U2 .11572+U2 .11542+U2			10462412	.11274.12	.11270+02	.11459+32
y5.0 .11861.u2 .11224.u2 .11541.u2 y5.0 .119161.u2 .11320.u2 .11572.u2 140.0 .11918.u2 .11320.u2 .11623.u2			24+54011	.11+29+02	.11426-02	.11687+42
140.0 .11918+u2 .11324+u2 .11623+u2 .11623+u2				50-24c11.	.11541+42	.11715.02
		21.81011.	.11320+02	.1102J•U2	.11672+112	.11767.62
			1			

Table 8. Values of Attenuation (dB/Km) at Precipitation Intensity R = 25.00(mm/h)

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					Descal I
30.6	.15283+01	10+61/21.	10+420+7.	18-1015-19	7 A A D 7 D 0 7 4
15.0		.28652.01			13+18510°
20.0	56289+01	. 45490.01	194244rc.	10.55940.	10.9212°
25.0	.H0551+u1	1000000	./2673.01		.746A5+81
	21-22-11	19.55468.	. 94651•UL	.94280.03	.97689.01
	12500+02	50.0001.	· 11449+82	.11389+42	.11829+02
1.04	14184+42	. 12141.02	.1.112.02	50+7+05T.	13537+0
	15502+42	.1.5408+42	-1455.U7	.143,3402	•14895+D
	1652+42	523.0 · U	.15523.02	.15449+U2	.15963+02
	>0+01C1.	.15426+42	50+702A.	.10323+U2	.16798+62
	17615+42	20+6161.	.17654+02	.1099/.02	.17445+45
	18365+12	.16748.42	.17546+42	.17537.02	.17958+82
0 - 1	10775+42	.17250+32	.18013.07	.17994.02	.15387.02
	19110+42	21.2051.	.1H4U5+U7	.14388.U 2	10.74747.
	19410+42	14474.42	.1874.02	.147.52.402	19494940
		- 1H4U3+U2	.19422+42	5U+41041.	10-12-01-
	19462 · US	.18656+U2	•14224•07	.14225+42	.19558+02
	20-001	. 18846+92	-10375+UP	.193/4.02	28+ ¥ ¥967*
140.0	-1958+42	50++3641.	.19471+02	というしていて、	.19772+63

Table 9. Values of Attenuation (dB/Km) at Precipitation Intensity R= 50.00(mm/h)

(ZHR)	411	A I	Antu	AC	AS
	1461 Jan1	[[++]>>>>.	10.24066.	19-6462.	. 12568+83
		10000000	. 65763.01	. 66157.01	
		(0+T150A-	.10373+02	.10349+U2	.186 26+02
		50.62251.	. 14401.00	24-226-82	.14946+02
		. 1 6 7 6 7 6 1 6	1812	1791-07	·1847•92
		10178412	-2116/02	20942-02	.21957+82
	96419449	2101012	23563 - 42	23348.02	.24390.82
		23630+12	. 25584.02	25313•02	.26323+82
		2540+0X	20.21.12.	26941.02	.27982+82
		26761.42	24412+02	2H2H1+02	.29182+82
		27950422	24444-42	24367.02	.36287+02
		28421+62	20.92506.	. 38262.02	20+57717"
		201102	31.44u2	. 51025+02	
		C1.424.42	20.00110.	.31715.02	28+28427"
		31150+12	. 32333.02	. 32306.02	.12453+87
			20+20F2C-	. 32/89.42	とヨ・サーサワファ
			23344462	53147+U2	23+44207
		324242	23.485.422	219292.2.	50 · 53655 .
	24.196.6.	.32786.42	.335/3.02	.33547+42	28.20757.

Table 10. Values of Attenuation (dB/Km) at Precipitation Intensity R=100.00(mm/h)

10.0 577600000 10.0 577600000 10.0<	(240)	A11 .	7 I V	Ant D	AC	4
10. 57640941 *7640941 *7161441 *5765601 *160402 *160402 26. 24079402 *17723402 *1753402 *1554402 *1554402 *1554402 *1554402 *1554402 *1554402 *1554402 *1554402 *1554402 *16440402 *1640402 *1640402 *1640402 *1640402 *16406						
11	10.0	.576.09+31	.4/861.01	19-25754.	[コ・カケブジで。	10-01410-01
26.0 17723.0 15558.12 15564.0 16558.12 15558.12 15558.12 15558.12 15558.12 15558.12 15558.12 15558.12 271397.12 271397.12 271397.12 271397.12 271377.13 271377.13 27137.13 27231.13 27231.13 27231.13 27231.13 27231.13 27231.13 27231.13 27231.13 27137.13 27231.13 27231.13 27231.13 27231.13 27231.13 27237.13 27231.13 27237.13 27237.13 27237.13 27237.13 27237.13 27237.14 27247.14 27237.14 27247.14 27237.14 27247.14 27247.14 27247.14 27247.14 27247.14 27247.14 27247.14 27247.14 27247.14 27247.14 27247.14 <td< td=""><td>15.0</td><td>21136+42</td><td>16.16875.</td><td>[u.duore.</td><td>.100.50.02</td><td>28+77947°</td></td<>	15.0	21136+42	16.16875.	[u.duore.	.100.50.02	28+77947°
25.0 224079.02 1.4734.02 21400.407 21400.407 21400.407 35.0 27127.42 27400.407 27404.42 27404.42 27437 35.0 37127.42 255.0 27404.42 27404.42 27437 45.0 35910.42 27250.42 35151.42 2750.42 27437 45.0 35910.42 357610.42 35760.42 37440.42 37440.42 37440.42 45.0 36314.42 357440.42 357440.42 357440.42 3440.42 3440.42 3440.42 34440.42 34440.42 34440.42 34440.42 34440.42 34440.42 34440.42 34440.42 34440.42 34440.42 34440.42 34440.	20.0	-17723+12	5L+82ct.	-15040402	.15528.82	.1AU94+07
36.0 27127-42 23397-42 26500-42 274570-42 274570-42 35.0 35910-42 27250-42 3514742 351570-42 312670 45.0 36314-42 35570-42 3550-42 37570-42 37570-42 50.1 36314-42 35570-42 35570-42 3570-42 37570-42 50.1 36314-42 35570-42 35570-42 3570-42 37570-42 50.1 36314-42 35570-42 35570-42 3570-42 37570-42 50.1 36314-42 35570-42 3570-42 3779-44 50.1 400000 3770-42 3779-44 3779-44 50.1 400000 3770-42 3779-44 3779-44 50.1 400000 3740-42 3779-44 3779-44 51.1 400000 41200-42 41090-42 41090-42 71.1 4120-42 41090-42 41090-42 41040-42 71.1 440000 4100-42 41090-42 41040-42 71.1 45774-42 41090-42 41090-42 41040-42 71.1 45010-42 41090-42 41090-42 41040-42 71.1 45010-42 410090-42 41090-42 41090-42	25.0	-24:79+62	14/34+02	-21400-42	.21059+02	27241+U2
35.0 37.939.02 37.940.02 35.940.02 37.940.02	3.01	2012/02	20.9797.02	-24202054	.25808.02	57-337 · 47
43 35 36 36 37 <td< td=""><td></td><td></td><td>- 27230+ 42</td><td>. 346-0-42</td><td>.29628.02</td><td>.J12A2•U7</td></td<>			- 27230+ 42	. 346-0-42	.29628.02	.J12A2•U7
55 36314-42 35544-42 35544-42 35544-42 35544-42 35544-42 35544-42 35544-42 35544-42 35544-42 37557-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 37544-42 41754		50+0105r.	31134/+02	515141412 ·	. 52726+02	ショ・コショナフ・
50.1 40.2567-42 35.3727+42 -37257+42 -37257+42 -40.254442 -40.2546442 -40.2746442 55.0 40.164142 -37257+42 -37257+42 -40.254442 -40.274642 -40.2746442 60.0 40.167442 -37257+42 -37257+42 -40.44142 -40.27462 60.0 40.167442 -37257+42 -40.44142 -40.27462 -40.162 71.0 40.05742 -37254442 -40.44142 -40.27462 -40.162 -40.162 71.0 40.05442 -41.252442 -41.252442 -41.964412 -41.964412 -41.4644 71.0 45744442 -41.2524442 -41.4224442 -41.964412 -41.964412 75.0 -45742442 -41.4224442 -41.4224442 -41.964412 -41.964412 75.0 -45412442 -41.4224442 -41.44454442 -41.964412 -41.964412 75.0 -454124442 -454124442 -45412442 -45412442 -45412442 75.0 -45412442 -45412442 -45412442 -45412442 -45412442 75.0 -45412442 -45412442		-38314+42	.3.3040+02	su.lond	50.01245.	.54468.02
55 0 </td <td>20.1</td> <td>20010</td> <td>~ コ・コンコンロー</td> <td>- 31794.42</td> <td>. 3 7 4 4 0 • 3 2</td> <td>27+70640*</td>	20.1	20010	~ コ・コンコンロー	- 31794.42	. 3 7 4 4 0 • 3 2	27+70640*
0 0 44054402 36646442 366444402 41965402 41965402 5 0 44069402 4123442 41254402 41965402 419646402 7 0 4496942 41254402 41254402 41965402 419646402 7 0 44973442 41254402 41254402 41964412 7 0 4574442 41254402 44455402 45937402 8 4574442 43264402 43974442 459470402 45951402 8 45744402 43574402 45917402 4592402 8 45745442 45912402 45917402 45471402 9 45912402 45912402 45212402 45212402 45 45212402 45212402 45212402 45214402 45 45212402 45212402 45214402 45214402	5.0	41841 UZ	5725 - 5372	50. France .	54248•UZ	-40027+U2
55.0 4405942 4123442 41453442 41595402 4315540 71.0 44925412 41255442 41255402 41455402 4496402 75.0 45741402 41255442 44455402 449537402 449537402 75.0 45744402 43267402 4455402 449537402 449537402 81.0 46974442 43267402 4456402 449537402 45937402 81.0 4690242 43574402 45974042 45927402 45571402 95.0 47204402 45912402 45917402 457775 95.0 4760402 45212402 45213402 95.0 47612402 45213402 45213402			- 26764-42	.4041+02	.40754.02	41990+02
71.0 44928-02 45042 450402 440640 75.0 45701002 47250002 44002 449330 75.0 45701002 47250002 44002 45051002 90.0 4500200 445500002 44550002 45002002 91.0 47200002 445500002 445500002 45500002 95.0 472000002 445500002 45500002 455000002 95.0 472000002 4455000002 455000002 455000002 95.0 4720000002 455000002 455000002 455000002 95.0 4720000002 455000002 455000002 455000002 95.0 4720000002 455000002 455000002 455000002 95.0 4720000002 455000002 455000002 455000002 95.0 47200000002 455000002 455000002 455000002 95.0 47200000002 45000000002 455000002 455000002 95.0 475000000000000000000000000000000000000		44169+42	41233+02	20.0182.8.4	.41965+02	.43105+82
75.0 457×1+02 473529+02 44455+02 44937+02 44937+02 81.0 4637×1+02 435207+02 445095 44740+02 45695 81.0 46902+02 43504+02 45470+02 45621+02 45515 95.0 47266+02 445604+02 45511+02 45922+02 467739 95.0 47600+02 45512+02 45511+02 45223+02 472914 95.0 47600+02 45333+02 462712+02 45273+02 472914		44020+12	41250+12	- 4 3 4 2 4 6 7	.4.9.9	.44060+62
01.0 .463/4.42 .432e7.42 .43470.422 .45603.4 05.0 .46002.42 .43970.472 .45470.402 .45420.402 .4563154 05.0 .46002.42 .43570.472 .45470.402 .45671402 .4567154 05.0 .47266.42 .44560.402 .45917.402 .45972.402 .467739 05.0 .4740.402 .45412.42 .45212.42 .457739 05.0 .4760.402 .45333.42 .45213.42 .47291.42	75.0	457.1.02	51575°	- 4 4 0 5 5 + 1 2	.45937+82	と
B5 A6902+u2 A5970+u2 A6412+u2 A6420+u2 P0 .45266+u2 .44560+u2 .45517+u2 .45922+u2 .467759+u2 P5 .4740u+u2 .455012+u2 .45512+u2 .45213+u2 .47291+u2 D1 .47610+u2 .45333+u2 .4547u+u2 .45213+u2 .47291+u2	A 1 - 2	20+0/290	. + 32 0 / • 42	50.00147.		28 • 20034 •
98.0 47266+u2 44560+u2 45917+u2 45927+u2 46773+u 95.0 47400+u2 45012+u2 46251+u2 46223+u2 47291+u 100.0 47600+u2 45333+u2 45333+u2 47291+u	0.50	46002+07	-+39/0+r	454 at > 02	.45420+02	28+51244.
95.0 .47490+02 .45412+02 .46251+02 .46251+02 .47880+1 200.6 .47686+22 .45333+02 .46270+02 .46504+02 .47291+		47966+42	.445444	- 45417+02	.4592.4u2	44775+82
140.0 .47686-82 .45333+82 .45478882 .45291+82 .47291+8		47494+42	. 45412+42	- 46241+02	.452/3.42	. 47686.82
	3.641	.47610-12	45333+u2	-4r47u+ů2	. 405U4•U2	.47291+82

Table 11. Values of Attenuation (dB/Km) at Precipitation Intensity R=150.00(mm/h)

	•	•		•	•
4 Ú a U	ñu•28972.	1.1 / Z • U.1	10.47411.	12.84072	+2-2624F*
15.0	.57H27+UD	• 55367 • UI	.12924.01	10.00.00.	*54424 · 88
27.0	.//6?0+16	.74052.00	.13864.01	12+42841.	20.00797°
25.0	. 91.942+40	.92464+uR	.14764-01	10.50/10°	HQ • 1 4 4 4 4
J = 0	10.77611.		11040401.	11.40231.	11400.01
35.0	.1.4 .4 . 0.1	lu-cu/dr.	. 16550.01	1444051.	.13246•U1
41.0	.15138.01	[0++4+***	10.5052.	14740401	.14420+01
45.6	.16729.01	lu.chui.	IU.BAIAI.	.10367.41	ID+PICAL.
5 0		10.14571.	. 18860.01	11/10/11.	.17426.01
55.0	.10334+#1	.laaly.al	10.47441.	.18976+U1	19.24141.01
6 U . U	.20.531+01	Lychot .	14492+41	10.20001.	.24141.41
65 u	.2111d+ul	10.0000.	(D•22+H2•	[1+48412.	10.27465.
70.6	.21663.01	[U·/1115.	10++2/02.	19.99212.	10.14415.
75.4	.2144441	.215n4+v1	10.11405.	10.42112.	10.42812.
(1 ° C)	.21970.01	-210ft-11	- 21996+41	10.41515.	10.16915.
d5. II	-21A74 2	.21636+.1	10+58682.	.21730.01	.23447+01
93.0	.21546+41	1012.	-24910+01	10.01412.	.21540.43
95.0	.21,332+01	.21.4.4.4	10+26405-	.21.5.5.15.	10.61512"
1.00.1	.21140+00	10.0212.	.20702.01	11052441	19-21212.

• .

i,

Table 12. Values of Phase Displacement (%Km) at the Precipitation Intensity R= .25(mm/h)

25

*

\$

. 7 19 1 4		-	2	•	
10 - U	.15280+#1	.14313•11	. 39042.61	.14799+01	.14933.01
15.0	•23275+UJ	.21/73+41	.42773•01	22449-41	.22712+01
6.07	. 39684+41	10.10182.	• 46267•41	2~172•U1	LO.RETT?
25.0	.376/0+01	10+1[545,	.49542+41	10+00+00.	
50.0	+44152+UL	100/0100	. 52610+U1	10+56224.	13・90751
35.0	10+2000*	. 47utueul	.15429.11	10.9.654.	10.44104.
1.04	•5495U+v1	14-2026.	10.0067 C.	13・24404。	19+67146.
45.0	.53811.11	10.5006.	10+01646.	.5743d+01	10+16146°
50.0	.014/8·u1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	10.41410.	.¢0271+u1	
55.0	.6394U+U1	.6106/.01	-62420+31	.62053+01	.62/22.01
00.0	.637/3+ul	19++4-20.	10.9008.0.	[U + BUU / C .	
05.0	10.96469.	.62733+ul	.6.1270-01	. 6.6.3.4 + R.1	
10.01	10+1×1×0.	10.00/20.	-0-524z+Ul	.6.5067•01	12.0726.0.
75.0	.67242+41	•62U54•u1	.62843.01	.67148.03	.62266.01
60°	•00467•ul	.61093.01	.67233.01	.0053U•U1	6047409°
8 5 . u	.58162+U1	10.170HC.	. 61322-41	[U+0]CHC.	13.95/25.
9	•55662+ul	[]+08/24.	-04279+U1	10.52346.	26416+01
94.0	.53254+11	.540RY1	19+15596.	10+17924.	19+90144.
100.0	.51134+111	10+67752	10047586.	1454.41	.52454+01

Table 13. Values of Phase Displacement ($^{\circ}/Km$) at the Precipitation Intensity R= 1.25(mm/h)

10.1 .						
15 16 16 16 16 16 16 16 16 16 16 16 16 16 16 <		3 , ,				
20 35 37 <	10.0	. 241/6+0]	10.14102.	.62411.01	10.001/7	
29 35379.01 35379.01 351050 100000 100000 100000 1000000 10000000 100000000 1000000000 10000000000 1000000000000000000000000000000000000	15.0	42462+11		.69554.01	.48950+01	- 4 8 4 9 7 -
25 1 7 7 7 1 </td <td></td> <td>551/4.41</td> <td>[1.22.6] C.</td> <td>11.47.47.</td> <td>[]•]]•]</td> <td>- コビッサム・</td>		551/4.41	[1.22.6] C.	11.47.47.	[]•]]•]	- コビッサム・
36.0 37.0	20.0	67200+01	. 6245dew]	10.4410.4.	10.41840.	. 15747
			. / 2 4 / 4 + 4 5	10.4/100.	10.0114/.	11247
70 <				11+1444	10.1001 8.	. 84230
79. 71. <td></td> <td>1</td> <td>[· · ·] · · · · ·</td> <td>-94672+Ul</td> <td>LU.SAHAV.</td> <td>. 47.27</td>		1	[· · ·] · · · · ·	-94672+Ul	LU.SAHAV.	. 47.27
55.0 10.01 <			10.14416		10.11.25	.97454
55.0 10.0.3.42 94414.01 94414.01 94414.01 65.0 94671.01 94675.01 94414.01 97875.01 70.1 94787.01 97875.01 97875.01 97875.01 70.1 94787.01 97875.01 97875.01 97875.01 70.1 94787.01 97875.01 97875.01 97875.01 70.1 94787.01 97875.01 97875.01 97875.01 70.1 97875.01 97875.01 97875.01 97875.01 71.2 97875.01 97875.01 97875.01 97875.01 71.1 97875.01 97876.01 97875.01 97875.01 80.1 97875.01 97875.01 97875.01 97875.01			10+04/30-	(0.40/24.		+090A *
61.0 99.6/1.00 97.8/2000 65.0 -0015000 -012000 70.0 -0015000 -012000 70.0 -0015000 -012000 70.0 -001200 -012000 70.0 -001200 -012000 70.0 -001200 -012000 70.0 -0012000 -0120000 70.0 -00120000 -0120000 70.0 -0120000 -0120000			11.0.1146.	10.41040.	10・04・00・	.1945.
65.0 .0.1.30.01 .9.2.2.2.0.01 .9.2.2.2.0.01 .9.2.2.2.0.01 70.0 .9.0.0.0.01 .9.2.2.2.0.01 .9.2.2.2.0.01 .9.2.2.2.0.01 70.0 .9.0.0.000 .9.2.2.2.0.01 .9.2.2.2.0.01 .9.2.2.2.0.01 70.0 .9.0.0.000 .9.2.2.2.0.01 .9.2.2.2.0.01 .9.2.2.2.0.01 70.0 .9.2.2.2.000 .9.2.2.2.01 .9.2.2.2.01 .9.2.2.2.01 80.0 .9.2.2.2.01 .9.2.2.2.01 .9.2.2.2.01 .9.2.2.2.01 90.0 .7.2.2.01 .9.1.0.0000 .7.2.2.01 .7.2.2.01 91.0 .7.2.2.01 .9.1.0000 .7.2.2.01 .7.2.2.01		90×11×10	10.00200	1	[]. (0704 .	16444
70.0 .95054001 .5512701 .9785401 .97854001 .97854001 .97854001 .97854001 75.0 .97854001 .97854001 .97854001 .97854001 .97854001 .97854001 75.0 .0 .97854001 .97854001 .97854001 .97854001 .97854001 90 .0 .0 .97854001 .97854001 .97854001 .97854001 .97854001 91.0 .0 .97854001 .988450001 .91844001 .77850001 .77854001			10.0700.	1400000	.47874.01	. 9K. 6 N. 9. 3 G
75.0 93.9554001 245044001 245054001 245054001 245054001 24505001 90 80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 90.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 90.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 91.0 91.0 91.0 91.0 91.0 91.0 91.0 91.0 92.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0 93.0		10.000		10.7474.	10.460.44.	. 44/42.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.				10.04444.	10.10014.	.94146.
R5.H .65555901 .1781201 .4374701 .665<5901 .66555901 90.H .61544001 .8415401 .91400001 .4727201 .67 95.U .7727701 .84450001 .94000001 .7878001 .71			14.0.214.		. 70451.03	. 1 N N N N N
90, H 61744441 6441 6441 4441 472641 62672441 627 95, U 7777441 88454441 64421 7787441 678748441 778748441 778748441 77874444144414 77874444414 7787444414 778744414 778744414 77874441444414		.654540	1412.41	13-24250	. 86686.01	
95.0 .7177.041 .84450.01 .94000.01 .78748.01 .74 95.0 .7127.041 .84450.01 .4445450.01 .77579.00.01 .75				• V] BHB• [1]	.07672.01	CABSD.
		. 77 2 7	10.06488.	. 94064.01	18788.01	.10441.
		10.4/40/.	1111/01/11	. dH .HV . U]	./5290.61	. 73254

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Table 14. Values of Phase Displacement (°/Km) at the Precipitation Intensity R= 2.50(mm/h)

27

(ZHn)	L11	F1	Infu	ſĊ	5
10.6	52315+01	. 484.33.01	-1002+02	.50174.01	10+74/04.
	77871+01	11281.01	.11214.02	.74426.01	e75423+01
	10-50205.	10.17610.	.17250+0"	. 45648.01	.97160.41
		1	1.5143.07	.11458+02	.11657.87
		12574+12	11934.07	.13069.02	111004.02
		1.400+42	.14503.02	.14332.02	.14585.42
		~ 1 4 4 A 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	-15u52•02	.15206.02	.15450.87
		20.1221.	50.84.641.	.15690+02	15923+82
		219912-12	.15451.07	.15811.02	.16010-02
		15538.42	515414.07	.15640+02	.158-5.82
		- 15-212-42	20.10241.	.15291+02	.15432 .
		20-526-1	.15113.02	.14862-02	.14974+82
		5	.14900.02	.14391+02	·14477+U2
	20-9471 I -	140.48.42	.14669.07	.1.3862.42	.13926.07
		13487+42	50+775FT.	.1329/+02	.13302+82
		12873-42	.14080.02	.12590.02	.12617.02
		C	.1.1700.02	.11907+02	.11919.82
		. 11613.42	24.04451.	.11254+02	.11255.82
		11044+12	.13172.02	.10665+87	.19658+82

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Table 15. Values of Phase Displacement ($^{\circ}$ /Km) at the Frecipitation Intensity R= 5.00(mm/h)

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10.0 .11844.02 .17954.02 .1590 25.0 .29107.02 .29107.02 .15750.02 25.0 .29107.02 .29107.02 .27950.02 25.0 .27950.02 .27950.02 .27950.02 25.0 .27950.02 .27950.02 .27950.02 25.0 .27950.02 .27950.02 .27950.02 25.0 .27950.02 .27950.02 .27950.02 25.0 .27950.02 .27950.02 .27950.02 25.0 .27950.02 .27950.02 .27950.02 25.0 .27950.02 .27950.02 .27950.02 25.0 .27950.02 .27950.02 .27950.02 279.0 .27950.02 .27950.02 .27950.02 279.0 .27950.02 .27950.02 .27950.02 279.0 .27950.02 .27950.02 .27950.02 279.0 .27950.02 .27950.02 .27950.02 279.0 .27950.02 .27950.02 .27950.02 279.0 .27950.02 .27950.02 .27950.02 279.0 .27950.02 .27950.02 .279	(247)	113	-	J HF J	11	FS
27 15 27 15 27 15 16 15 16 15 16 <td< td=""><td>4 6 7</td><td>. 1 5 k 4 a 1 a</td><td>211730012</td><td>17424.02</td><td>21.010.12</td><td>.11462+97</td></td<>	4 6 7	. 1 5 k 4 a 1 a	211730012	17424.02	21.010.12	.11462+97
25.0 21471.02 2275540.02 2740.02 2740.02 2740.02 2745.02 2145.02		-17061+22	15450-02	20271.02	Su+64241.	.16539.07
25.1 27.755300 27.755300 27.755300 27.755300 27.755300 27.755300 27.755300 27.755300 27.755300 27.755300 27.755300 27.755300 27.75500		21471-02	19540+117	. 22230.02	.20.372.02	50+15An5.
35.0 27953.02 27199.02 26159.02 260000.02 260000.02 260000.02		.25012+02	2275642		.2 1462 . U 2	.24422+02
35.0 29.307.00 27.199.47 26.99.00 24.05.07.00 24.05.00 <t< td=""><td></td><td>20.000</td><td></td><td>50.01545.</td><td>.24456-02</td><td>.27085.07</td></t<>		20.000		50.01545.	.24456-02	.27085.07
45.6 20597107 26597107 26597107 26597107 50.6 277501007 277501007 277501007 277501007 277501007 50.6 277501007 277501007 277501007 277501007 27750000 50.6 277501007 277501007 277501007 27750000 27750000 50.6 277501007 277501007 27750000 27750000 27750000 50.6 27770000 277500007 27750000 27750000 27750000 51.0 27770000 27500000 27750000 27750000 27750000 50.0 277000 2750000 27750000 27750000 27750000 27750000 70.0 270000 270000 2750000 2750000 2750000 2750000 2750000 70.0 270000 270000 2750000 2750000 2750000 2750000 2750000 70.0 1700000 2750000 27500000 27500000 27500000 27500000 70.0 17000000 27000000000 275000000000000000000 275000000000000000000000000000000000000		28440+12	27199.02	20.001.02.	.24045.02	.24057+87
50.6 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 277000000 277000000 277000000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 27700000 277000000 277000000 277000000 277000000 277000000 277000000 277000000 277000000 277000000 277000000 277000000 277000000 277000000 2770000000 2770000000 2770000000 2770000000 2770000000 2770000000 2770000000 27700000000 27700000000 27700000000 277000000000 27700000000000000 27700000000000000000000000000000000000		20.5117+02	54.H.H.S.	.26597+12	.24674-42	.29225+07
90. 277920.02 27753.00 27150.00 17713.00 27153.00 271		20405.02	24509.42	- 20601 • 112	.24542.07	.29000-02
55.0 -25501.02 -25501.02 -25505.02 -25009.02 -2505.02 <td< td=""><td></td><td>210202</td><td>50.5412.</td><td>.20433.02</td><td>.278.46.42</td><td>.24194+07</td></td<>		210202	50.5412.	.20433.02	.278.46.42	.24194+07
60.0		26501+42	Suedas.	-25494.02	.24/13.42	-27UA0+07
65.0 .2357189.42 .24674.42 .24574.42 .245412.42 .245412.42 .245412.42 .245412.42 .24144.42 .24444.42 .24044.42	6 1 1	20.01.02.	5001002	50.44.40	50+14+45.	.25645+02
70.0 .23577.00 .2404000 .2404000 .23012.00 .23012.00 .23012.00 .23012.00 .23012.00 .23012.00 .21000000 .21000000 .21000000 .21000000 .21000000 .21000000 .21000000 .21000000 .21000000 .21000000 .210000000 .210000000 .210000000 .210000000 .210000000 .210000000 .210000000 .210000000 .2100000000 .2100000000 .2100000000 .2100000000 .2100000000 .21000000000 .21000000000 .21000000000 .21000000000000000000 .21000000000000000000000000000000000000		2018402	.24074.02	54403 · B2	-24205+02	.24315.07
75.0 .215404.02 .215404.02 .215404.02 .215404.02 .216054402 60.1 .104444.02 .215454.02 .255494.02 .21054402 .21054402 60.1 .10414.02 .20124402 .104414.02 .20124402 .20104402 60.1 .1745 .2115402 .17114402 .17115402 .17115402 .17115402	20.2	-22412402	51 · / / 652 ·	-24042462	.23612.62	•23U70+07
00.0 0.10 .20000 .2000 <		21162012	21+4442.	.23604+02	.21540.02	-216A9+U7
0.0 .1441.02 .202570.02 .19441.02 .19 0.0 .17000000 .20000000 .17000000 .170000000 .170000000 0.1 .170120000 .1701200000 .17010000000 .1701000000 .17010000000		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~u+CH215.	-23244 42	.24654+42	.20052+02
90.6 •17 •17000000 •17000000 95.0 •16179000 •17113000 •170000000 95.0 •16179000 •171130000 95.0 •16179000 •171130000 96.0 •171130000 •170130000 97.0 •170100000 •170000000000000		14513+12	50505050	. 27670.42	.19441.42	20+11+07*
• 161 • 161 • 171 • 180 • 171 <th< td=""><td></td><td>50+5451.</td><td>1969402</td><td>• 27103•62</td><td>.18254.02</td><td>41+241A4</td></th<>		50+5451.	1969402	• 27103•62	.18254.02	41+241A4
180.0 . 19130442 . 17415407 21804442 19424442 44		.16179+02	. 18088 . 52	.21544+02	.17113+U2	.17456+82
	101.2	50.0016L.	.17415+0?	.21004+02	. 10443+42	. 4 6 9 5 9 7 9

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Table 16. Values of Phase Displacement ($^{\circ}/\text{Km}$) at the Precipitation Intensity R= 12.50(mm/h)

t	ı	9
÷		

FMEJ

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F(3H2)

8

28.TCR22.	20.11122	20.14105.	-23911.07	-20321+02	
20.09252.	.2.729.02	20+/0610.	.25433+82	.21896+42	95.0
25310+02	21+94447°	·.1748.U2	50+C112.	.23602+42	7 . O
274A0+02	. 27314.42		.24914.02	.25564+112	45,0
.29136+02		50004655.	.39/20+02	-2759 + + UZ	0 ° C P
	20+/+1:5.	- 4461.02	57542+02	.29613+02	75.0
	23・40305。	20.82550.	.34570+02		70.0
.35200+07	50.001 66.	- JAJA2+U7	.36404.02	パコ・のうじのの。	65.0
.J7578+U2	574354Z	. 37378•02		.J6341+U?	60.0
.40141+02		いいちょうよいい。	.41508+12	.39147+42	55.0
• 42058+07	.42185+02		.424F8+B2	54144/+N2	50 ° C
.44827+02	.44150+02	50.441.44	• 4 4 U 1 U + U ?	.44291+12	45.0
.44328+82	.45418+U2	.44580.02	. 44744 uP	-46120+02) ° 0 •
.44716.82	.45609+02	- 4 - 4 I V • 0 2	• 44157422	10+000V.	35. 0
.45450+02	.44234+02	.54481.42	.42593.u2	.46354+42	30.05
• 47 496 • 67	.4122+02	. 4760A+U2	. 38955.u2	.43050+02	25°U
.16647+82		.35642•u?	51+C3255.	.37770+42	20.0
.29034+02	.28990.02	50+55412.	57325+02	.37711.42	15.0
.21 UA9 . 02	20+20/02*	.27984402	.14240+02	.21443.02	40.0

Table 17. Values of Phase Displacement ($^{\circ}/\text{Km}$) at the Precipitation Intensity R= 25.00(mm/h)

F (LHZ)			1 4 4 F	ن +	N
				1 H K 7 3 4 0 3	0.0000
50 - U -	20+0/376.	2010/02404			
	556AH+C2	. 4HB1 0+U2		.52200+02	0 • • • • • • • • • • • • • • • • • • •
		20.2.20	1000 - 100 -	6 1:4-52	05225+U
				.10.19~32	.72.868•0
				71161+02	, 7AU62+U
				10.20.00	.75606.0
				1 + 5 + 0 2	0.78851.
				68674+u?	0.0440.
			58 · 0 / 6 / 7 ·	.041-02	.04509.
			5. Jul	.69107.02	.60233+0
		58311.42		50.07195.	U+0804C.
		~ • / • > • • •	51.51.61.6	50+85.65c.	0.01234.
				44218+02	0+19911+U
				46092.02	.45739+0
10 • U			474746	43015+02	.47646.0
			21+7H2H2	3001-002	4458°
00°				. 37 109 0 2	7+7+7+7 ·
				14271+02	U
¥7.0					1+40415.
7		20.4100.0.			

Table 18. Values of Phase Displacement ($^{\circ}/Km$) at the Precipitation Intensity R= 50.00(mm/h)

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10.0 .74855 15.0 .74855 20.0 .1147				
15,42 - 11,47 20,02 - 12,02	•62 •66630 • 02	59-20-565	./1>66+u2	21.02557.
20.0 · 11.55	50.4007P. 601	54527 · J2	. 4.698.62	. 57050+12
	103 . Lb455+A.	50.50000	.11Ub 0 •U3	.11006.0.
25.6 .L?.	Luderly. Cut		.11992.03	.17521.0
Jeen		.l.?.!.	.17169•0J	.17549.0.
35.4	LJ.5411. LJ.45.	14124444	.1191u-u3	E0+44141.
40°0	ture tibau.	.104JJ.03		LU070011.
45.6 .1.1611	••30 •11. ••3	. 7 . 10 5 . 4 2	80.000 .	10.12601.
50.0 · · · · · · · · · · · · · · · · · ·	• u2 • . 100 13 • u1	. 45695+42	.10322•03	.10.17601.
55.0 .10/0	Lustull. Sur	• • • • • • • • • • • • •	20+68162.	. 46706. U2
69.0 45350	• 62 • • • • • • • • • • • • •	56.14504.	5U+62214.	. 20465-42
66,0 .79306	102	200027240	.45649+42	.44738+82
79.1	•42 •4525.12	50+tn544.	.80432+42	.79441.02
75. U	52.00206. 52.0	5J+15(5H.	~/>+21+N2	.74417+02
80*Ca	•4: •75656•42	• d 15 n 7 • U 2	./0.361.02	0002200°
85.0 .58200	•u? •15780+u2	• 74uns • U?	50.67240.	.04716+02
90.U .53271	20.000000000000000000000000000000000000	• / 5 6 4 7 • 8 2		· · · · · · · · · · · · · · · · · · ·
95.4 .48614	5"+01410. 214	54.14511.	5049794C.	
	51.522C. 41.4	********	51+65+1C.	28.147.85"

Table 19. Values of Phase Displacement ($^{\circ}$ /Km) at the Precipitation Intensity R= 100.00(mm/h)

(Zhe).	511		H MF II	۲ ۲	\$
			1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0.1.0.1	EU+40401-
40.4					11403411
15°"	53+53+57.	1229240	· D • / = H] •	Ch+70701*	
20.0	.15721.03	.]4048+U }	.1.5061.	.154.38.33	57470G+87
	- 1726-63	51-14-1 · · · 3	.1.4049+0.5	.16348.03	.17190+03
30.6	16817+15	L16219+05	L19445.1.	.16423+03	.1.0446.03
	10162+03	1601403	.1.1745+UJ	.16013.03	20+55747*
	15112+03	.15552.03	L1522+UJ	.15416+03	60+57641.
	2 1 + 1 B 1 + 1 -	. 15427.03	.15244.03	.14/24.03	.14742.03
	. 1.4755+ J.	.14340+1.3	cu+1c421.	L1994U+UJ	.1.1902-03
	50+255 T	51.470 U + 1.3	.1?>no.6.	51.97 · U3	• 13u55 • UJ
61.4	.11472+13		.12230.0.5	90.414/1.	.12240.03
		LP311.03	.11891.0.5	. 11643.03	E3+50+17*
1	50+0+XC6.	Cu-Soalt.	.1156/•44	Cu+4991.	20+6CRUT*
	-931.16+42	. 1104/+n J	.11264.03	61+1+511.	.10156+83
	.86.4.54	. 11411+u3	•1+041+6J	.96831•U2	.95023+02
95.0	.745.1+42	97726+12	.14672.05	. 40162+07	- B - E - E - E - E - E - E - E - E - E
	77645+12	×1353.02	.1.1000.	5U+464r8.	50+6661R*
2	5 n + 4,6 e 9 .	.85346.02	.1444.45	.//510+02	./AU51+82
3.041	61694+42	20+1640%	50+42 5 40.	./?0॥५•02	.70753+82

Table 20. Values of Phase Displacement ($^{\circ}$ /Km) at the Precipitation Intensity R= 150.00(mm/h)

1 DIAHETRO		SKK	11		54 41
0.25	0-3393993216-05	7	0 .1 40445467E-03	0. 32 3101722E-0 3	J 0.1367567316-03
0.50	0.412966183E-04	7	0 •1 16060092E-02	C.379392150E-04	J 0.1099559016-02
6.13	0 .244910 829 E- 03	7	0.411709026E-02	G• 21 84 82 33 9c -0 3	J 0-379090034E-02
1.00	G. 1 10889 180E-02	7	0.104424097E-01	0 - 95 56 60 59 5E - 03	J 0.933215767E-02
1.25	0 •4 40577418E-02	7	0.219819173E-01	0-362505694E-02	J 0.190828703E-01
1.50	0.1519151546-01	7	0*384999365E-0 1	0.120885111E-01	J 0-330430605E-01
1.75	0•340193059E-01	٦	0.4991803162-01	0 • 290199082E -0 1	J 0.435243137E-01
2.00	0.4>1665856E-01	7	0-603063256E-01	0.414043511E-01	J 0-956267956-01
2.25	0 °5764 36259E-01	7	0 •8 49 6 49 3 10 E - 01	0.489891053E-01	J 0-510930578E-01
2.50	0-814852119E-01	-	0.117840588E+00	0.596768036E-01	J 0-167533183E-01
2.075	0.1135667906+00	7	0•155000521E+0C	0-811892152E-01	J 0-340874896E-01
3 • 00	0-1 65 47 668 0 E+00	ר	0.199864236E+00	0 . 959444256E-ù 1	J 0•138244338E+00
3.25	0.2303727876+00	٦	0+343303657E+00	0 ● 109081556E+00	J 0.•134803112E+00
			, ,		

Table 21. Values of Forward Scattering Function at Frequency of 10 GHz. Key: 1-Diameter

101AFI30	S	SKK I Ι		SKAI
0.25	0.139240673E-04	J 0.476351638E-C	3 0.13 65 89 55 9E -0 4	J 0*403836594E-03
0 • 50	0-287175544E-03	J 0400875509E-C	2 C• 265529 14 6E-0 3	J 0.379579351E-02
0.75	0 •214368268E-02	J 0 .145 207718E-0	0.192288356E-32	J 6.133619122E-61
1.00	0-111352764E-01	J 0-356044509E-0	1 0.9705863895-02	J 0-319712199E-01
1.25	0-332292856E-01	J 0.604976056E-0	J. J. 29-484794E-01	J 0-532044172E-03
1.50	0•372534017E-01	J 0.9660192ilF-C	0. 50 20 37 74 1E -0 1	J 0.735709667E-01
1.75	0.9421954576-01	J 0+139337659E+0	10 C. 749425688E-01	J 0.105254829E+00
2 • 00	0.1594122796+00	J 0+198913104E+0	10 0•115498768E+00	J 0.139582515E+00
2.025	0-2547901875+00	J 0.26179564üE+D	0 0. 151695779E+00	J 0.1437326192+00
2.50	0-3687346985+00	J 0.311702742E+0	0 2.42067985665400	J 0.264882863E+00
2.75	0 ~54971402 9E+00	J 0-328017890E+C	0 0•3165991906+00	J 0.209255532E+00
3 •00	0.711949110E+00	J 0*3U5+0+123E+0	X6 0.422ª15694E+U0	J 6.278526495E+W
3.25	0•356897652±+00	J 0.260682344E+0	00 0+ 507764519E+00	J 0*406129837E+00

Table 22. Values of Forward Scattering Function at Frequency of 15 GHz. Key: 1-Diameter

1 OLAGERO	S	KKII		SKAI
0.25	0+6+3523542E-04	J 0.113419862E-02	Ŭ。ŏ1\$7?2335E−0€	J J.110439374E-02
0.50	0-114316889E-02	J 0-967654958E-02	0.1029792465-02	J 0.9 [61376635-02
6.73	0-921053632E-02	J 0.343174687E-01	0• 33 11 72 61 5E - 92	J 0.316028558E-01
1.00	0 . 363 858 074£-02	10-30952018E7.0 L	J. 2281Ac _272-01	J 0-6560397156-01
1.25	0.793339610E-01	J 0•12o385593£⊁uû	Se 5858 15 +7 28 −0 1	J 3.1064081796+00
1.50	0 .1584110 66E+00	J J•20403⊀561,E+50	0+37 (~++++7.2°)	J 3.1633754606+00
1.75	0,2922001322490	J J J 24261 372436È+CC	0+205244324200	J 0.2271221736+00
2.00	0.4302091722-00	J C.#3325310455+66	tic 32.235593 +JC	J U.2324234596+00
2.25	0.6912803656400	J 0=325902641E+06	··· +5355J44 16 +00	J 0.3137475856+00
2.50	0 •93210040 3E+00	J 0.277389252E+G0	0• 530965224E+00	J 0.325500346E+00
2.75	0•10433349 66+01	J 0 * 2 20 04 5 4 97 F + 00	Ge 7054 \$1 23 35 +00	00+3797856646£+00 L
9.00	0•1199678426+01	J 0 \$2000345556+00	0•609255719E+00	J 0.337915341E+00
3.65	0.137415218E+01	J 0.202389717E+00	u-9763071776+00	J 0+326870203E+00

Table 23. Values of Forward Scattering Function at Frequency of 20 GHz. Key: 1-Diameter

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חבושניום		SKKII		5441
0.25	0• \$\$\$904906-03	J 0.222384138E-02	0. 1595 8547 9E - 03	J 0.216539041E-02
0•30	0.327117415E-02	J 0.190955624E-01	C. 303241965E-02	J 0+1+0733912E-01
0.75	0-3+2619404E-01	J 0*639720393E-UL	1° 224097259E -01	J 0 +5878 49021E-01
1.00	0.797094235E-01	J 0.132260760E+03	0• 03 1825815E-01	J 0.110036621E+00
1.25	0 • 1 6 295543 92+00	J 0*230552197E+00	P+150245542400	J 0+1 + 21:7115E+00
1.50	0.331925269E+00	J 0.317069352E+CO	0+233155978E+00	00+3759467672+0 L
1.75	0+6334288726+00	J 0.33944.0942F+00	0• 45 83 56 36 0F + 00	J 0.325711+29E+00
2.00	G -8 75924468E+00	J 0.243673992E+00	0+ 64 23 14 73 25 +09	00+3++256E1EE+0 F
2 • 25	10+3E 6666642 01*0	J 9=238939404E+50	0e 89235471 7: +00	U .335365534E+00
2 • 50	0.1274799314+01	J 0.22369386E+00	0.945581348E+0u	J 0+347520199E+00
2.75	0.151263046E+01	J 0. 236906230£+00	₩• 1u7242630E+01	J 0*395917416E+00
3.60	0.1818642626+01	J 0*249628649±+00	0+ 1245144316 +01	J 0.460435320E+00
3 •25	U.217529297E+01	J 0.213243067E+00	0. i46717452E+31	U 0.535333037E+00
				,

Table 24. Values of Forward Scattering Function at Frequency of 25 GHz. Key: 1-Diameter

DIAGETAD	5	244.11		SKKI
0.25	0.361726952E-03	J 0.335604962E-02	0• 345053 15 9E-03	J 0-375460926E-0
0 • 50	0 •755892321E-02	J 0-330804661E-01	Ce 10:417379E-02	J 0.312997065E-0
0.75	0.50830639965-01	J 0.104620576E+00	0.4002411026-01	J 0.9564736225-0
1.00	0.160513778E+00	J 0.215396225E+00	0.1.54594605+30	J 0.108646197E+0
1.25	0°386344790E+00	J 0-321464121E+00	0• 30 226 266 45 +00	J 0.287070572E+0
1.50	C+084965253E+00	J 0.3380050666400	0+5273493825+00	0+385151586+0
1.75	0.9558507836+00	J 0.e279524922E+00	0• 752403915E+00	J 0+30904110E+00
2.00	0.119433308F+01	J 0.236183405E+04	Ue 947548508E+00	0.342677355E+0(
2.25	0 •145666981E+ 01	J 0.2479128846+00	Q.113755703E+01	J ©.3847117426+3(
2•50	0.1805782326+01	J 0*273189247E+G0	₫+136157799£+01	J 0*464176953E+0(
2.75	0 •222437382E+01	J 0.242730677E+00	0e 164695072E+01	J 0.538204032E+0(
3 • 00	0.2642694476+01	J 0*) 49687350E+00	10+3600861461 *0	J 0.6 40377700E+00
3.25	0•305297279£+01	J 0-463137813E-01	9 • 2 25930309E • 0	J 0.685936530E+00

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Table 25. Values of Forward Scattering Function at Frequency of 30 GHz. Key: 1-Diameter

	'n			·
0.25	0.6948013326-03	J 0.615237040E-02	0. 1648532705-03	J 0.598066300E-02
G. 50	0.1510105285-01	J 0-523184761E-31	Q.1400c6147E-01	J 0-494843200E-01
0 - 75	Geg3299661E-01	J 0.152917904E+00	U. 34261775E-01	J 0 .1 44929290E+00
1 • 00	0-30205056 4 5+00	J 3.299720678E+00	U.• 249249637E+00	J 0.2 0648922E+00
1.25	0 •6 39111161E+00	J 0.344038903E+00	C•513110c97E+00	J 0.342174947E+00
1.50	0 - 961076558E+00	J 0.285012792E+00	0+ 195762131E+00	J 0.344273686E+00
1.75	0e123692134E+04	J 0+2434431316+0C	0. 1022188195 •01	J 0*345610022E+00
2.00	0,1563391206+01	J 0.269439757±+00	U+ 120694293E+01	J 0.444207528E+00
2.25	J•20055990 2E+0 I	J 0.285655399£+U0	0.157312591E+01	J 0.5U15129U2E+00
2 • 5 0	0 -2 5000028 cE+0 1	J 0.215345025c+00	0.195836441E+01	J 0*230099894E+00
2.15	0=2965537475+01	J 0.112>61822E+00	Q+ 23 00 32 919E+01	J 0.626253247E+00
3.00	0•345662890E401	J 0.4807453±3E-01	U - 2970564605 +0 	J 0.8881812692+00
3.25	U + 4032682425401	J-0 •23A907486E-01	C. 20917291cE+01	J 0.704825461E+00

Table 26. Values of Forward Scattering Function at Frequency of 35 GHz. Key: 1-Diameter

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A DIAHETRO	S	SKKII		SKKI
0.25	0-122300815E-02	J 0.919519737E-02	0 . 11 7036398E - 0 2	J 0-845301253E-05
0+50	0-272350758E-01	J 0-773653984E-01	0• 25 2263919E - 0 1	0-36761441870 L
61.0	0.162092149E+00	J 0.224525869E+00	0• 1425 1887 8E + 00	J 0*502014966E+00
1.00	0°494554759E+00	J 0.345542371E+00	0•41u326779E+00	J 0.329070151E+00
1.25	00+3 L 56£606 L 8+00	J 0*306811750E+00	0• 737073183E+00	J 0•347459257E+00
1.50	0 .120 06*926E+01	J 0*52024144%E+00	0 .1022 87 <i>0</i> 06E+ 01	J 0.340141296E+00
1.75	0.15671587@£+01	J 0.276618421E+00	0•131390190E+01	J 0*400487781E+00
2.00	0•207611179E+01	J 0+293171763E+00	0•169650745E+01	J 0.506960154E+00
2.25	0.26360797929E+01	J 0.207633337E+00	0.215753746E+01	00+31E1E165L5*0 r
2.50	0+317269085E+01	J 0.107979238E+00	0•261570072E+01	J 0*604339719E+00
2.75	0°376511574E+01	J 0.543118604E-01	0. 307796 <i>0</i> 01E+ú1	J 0*661396430E+00
3.00	G. 446344662E+01	J-0*361431390E-01	0.357394c95E+01	J C.TT4493158E+00
3.6	0+3191555026+01	J-0*214619935E+00	10+3E79E139736	J 0*829336464E+00
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Table 27. Values of Forward Scattering Function at Frequency of 40 GHz. Key: 1-Diameter

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DIABETSD	S			54 41
47°0	C+201558974E-U2	J 3.1312723765-01	0. 14 28 76 1145 -50	J L.127413704E-0
0+30	0-4563526615-01	0.1045840136+00	0.42172+114E-J1	J 0.187c2:900E+0
51 * 0	u € 65972240E+30	J 0*2904492626+10	1. 2321 h40325 •U0	J 0-248443260E+1
1.00	C. 70C436711E+00	0.+1711-111-60 L	0. 95745081E+31	J 6 *351#2*099E+
1.25	0.104640395E+01	J 0.265;661#0f+00	U= 3443,064,55+00	J. U.J 1448P392E+
1 • >0	0.1449163495+01	J 0+2094311246+00	+ • 12 5995 7USE + 0 -	J 0.3 /34756/36+
1.75	C+20107815cE+01] 0. 3036839966+00	ı • le94=776 ⊾ ^c •01	J 0 ** + * * * * 2 & 2 & 4
2.00	U.Z6+018250f+01	J 0+521769224E+30	10+2693156222-2	J 0.554.41450E+
2.025	0.3245650425+01	J 6-1997,9391.00	• 27 62 46 64 4 6 6 1	J 0.5x34048996+
2.50	10+3930997855+01	J 6.6434515004-01	J215694255+01	J 0.cc7481244t+
2.75	0.4732967656+01	1-0- 44595954 9-0	[0.]n c727226	J 0.744494531£+
3.00	0+3550 4 87525+01	J-0 • 225 + 15 031 + 30	0+46.2203217F+ UJ	J 0.9 376505546
3.5	C.641467190E+01	J-C-35748>921E+00	• 5024/#2105 •	9 0 662419349 C

Key: 1-Diameter

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Frequency of 45 GHz.

L DIAGETRO	·	KK 11		SKHI
0.25	0-315601681E-02	J 0.190508569E-G1	0. 30 19 71 69 2E -0 2	J 0.175753124E-01
0.50	0-724200010E-01	J (* 1 45959914E+(G	. 0. 607117238E-01	J C.137959349E+60
0.75	0*03720915E+00	J 0.339073598E+00	U+ 35094241 cE+0G	1 0*3"504"80E+UU
1.00	0°4412831683°0	0.430590713054℃0 L	C . 1779 61959E +00	J 0.3-39035.
1.25	0+129019165E+01	J 0.256460190E+00	6• .144 17 17 15+0 2	\$ 0*339350 522E +0v
1.50	0.181560135E+01	J 0+3051581386+00	ñ.157243429E+01	J G.439657986E+00
1.75	0.25072631 "E+01	J 0.256407612E+4J	11. 21 62 7007 65 0 1	J 0.5279723174+00
5 . 30	0.3163643615+01	J 0.1713070566+00	1.27400434cE+01	J 0-548599064E+00
2.15	U•393656921E+01	J 0.952796174E-C1	U+34032+3355+01	J 0.020742559E+U0
2 • 50	0.482839293E+01	J -0.288 (121341 E-01	10+35 66 h0 1414 *6	J].741460137E+U0
2.75	0•57386350 bE+0 1	J-0 - 209309639E+00	J. 4925 [497 PE+0]	J 0.8086924595+00
00 • E	0+92 60+00229+0	J-0 = 3 6595 88 10 E + 00	0.578645374E+01	J 0*928954959E+00
3.25	0-7510695166+01	J-0 .5 P1+5 74466+00	G. 6029c0652E+01	J 0.103679848E+U1

Table 29. Values of Forward Scattering Function at Frequency of 50 GHz.

Key: 1-Diameter

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DIABET 20		5 K K I I		SK ∧ I
62.0	0-474332273E-02	J 0.240765349E-01	0 • +5 37 \$2 09 «E -0 2	J 0-534421489E-01
0.50	0+110150516E+00	J 0.1557214785+00	L.101097405E+00	J 0.178566515E+0(
0 • 75	0+541056077E+00	J 0.356840253E+00	U=49445716E+00	J 0+352671742E+00
1.00	0.1054395696401	J 0.2 /1089779E+00	6. 34 23 13 97 0E +0 0	J 0.327325165E+00
1.25	0.152969311E+01	J 0.294337512E+00	••• 13057ª560E+01	\$ 0+37+360740E+00
1.50	0 •22 309436AE+01	J 0.298222542E+00	0+1950089976+01	J 0+41115491E+0C
2.75	0-2988400055+01	J 0.177395890E+00	11• 26 51 53 47 6E +0 1	J 0*218031826E+00
2.00	0+378004932E+01	J 0.148524243E+60	0. 33487339 LE+C L	J 0.50742646E+00
2.25	0-474281502E+01	J 0.945878774E-02	U+415345001E+01	J 0*91+8688376E+00
2.50	0+22423426401	J-0.174103200E+00	0• 20-29 73 4E +0 1	J 0*150096195E+00
2.075	0-c82896614E+01	J-0 •335¢68504E+00	fi. 5895UA 15 2E+01	J 0.956747046E+00
00°E	U -30 2605439E+01	J-0.563196957E+00	0+ 101109543E+01	J 0*100171089E+01
3+25	0.928£29335E+ù1	J-0.04+767213E+0L	0-8680553445+01	40+3490774634-0 L

Table 30. Values of Forward Scattering Function at Frequency of 55 GHz. Key: 1-Diameter

L DIANETED	S	KK 1 1		SKAI
0.25	0-68949543 6 E-02	J 0.313114263E-01	0. 6544 397 1 3E-02	J 0-304884240E-01
0.50	0.1615452776+00	J 0.234886050E+00	0• 1+ 77 65 93 4E +00	J 0.222878098E+00
0.75	U.717770159E+00	J 0-344359040E+00	0• 6404 6603 4 E +0 0	J 0*357300401E+60
1.00	0-121500206E+01	J_0 ~2 56138563E+00	0.110058550E+01	J 0.322193146E+00
1.25	0•182725716E+01	J 0.307883561E+00	0• 303539056+01	J 0.425043106E+00
3.50	0-2657104496+01	J 0.239959657E+CO	0. 23775767 +E +01	J 0.497834153E+00
1.75	0.3451786736+01	J 0.131907940E+00	0°314149094E+01	J 0.511076570E+00
2 • 00	0 • 447673035E+01	J 0-622034655E-01	0*39941425 3E+ 01	J 0*00065592E+00
2.25	0-557388306E+01	J-0-120123982E+00	0•49457645E + 01	J 0.690179288E+60
2•50	0-6732153896+01	J ~0 ~2 8654 3250E+C0	0+603512192E+01	J 0.748093426E+00
2.75	0-90+30183 46+01	J-0-507925749E+(C	0•7184393339E+01	J 0.873258770E+00
3 .00	0 • 942497993E+01	J -0 -7 99668252E+00	0• E37599 65 9E + 0 1	J 0 -996834934E+00
3.25	0+108976612E+02	J-0 •111 278725E+û 1	0• 369943714E + 0 1	J 0*993586302E+00

Table 31. Values of Forward Scattering Function at Frequency of 60 GHz. Key: 1-Diameter

- DIAMETRO	5	KK 11		SKRI
0.25	0.974557544E-Ú.	J 0.39#567617E-11	0• 13 [9 32 40 5E -0 2	J 0-3681133272-U
0=20	0•228761792E<00	J 0.2808930186+60	<u>~~~~</u> 20∻730541E+0C	J. 0.2c79948A1E+U
0.75	0.45090 950 96+00	J 0.314552565E+60	00+3E3811#181 *00	J 0.343461E12E+0(
1.00	0.134073277E+01	J 0.264722824E+tG	0.12754844E+) 1	J 6.336965561E+L
1.25	0.2171707156+01	J 0*3 04366312E+60	10+3+146+1461**	J 0.462029815E+00
1.50	0.3069917696+01	J 0.1754075496+60	. • 2400 5 400 2E +0 L	J 0-475906134E+00
1.75	0.4043947226+01	J 0.10739021E+00	it. 3549216166+03	J 0.533102526E+90
2.00	J.521811295E+01	J-0-4107343034-01	• =72397656E+01	J 0.6_7∠58420E+00
2.25	0.6439#2[29E+;1	J-0-5 7 631 39895 +00	1.5364600902 +0 J	J 0.000333306E+UC
2 • 30	0.7831628805+01	J -0 -4 25 85 105 70 c + 00	î•il…c1+ ⁴ 3 éE+3 ≦	J 0.75427c872E+00
2.075	C-934008434E+01	J-0.717592190c+CO		J 0.840229592E+0C
3 • 00	0.10896026ēE+02	J-0•1642917334+01	10+ 37 70 85 1 L + 0	J 0.959250053E+06
3.25	0.1255341366+02	J-0.1 455658916+01	. 1138726345+02	J C.8950400355400

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Table 32. Values of Forward Scattering Function at Frequency of 65 GHz. Key: 1-Diameter

	~.	SKKII		SKAI
0.25	0•13453936,1E-01	J 0-31869503675-01	∪+123622095E-01	J 0.435041514E-
0.50	C+312308729£+00	J 0.321787715E+00	3•245013974E+00	J 0.309747756E
0 • 75	0 •9890543 22E+00	J 0•28280∑820€+03	1 - 712001842E+00	J 0.3.3387146E
1.00	0 •159820747 E+01	J 0.257162423±+60	N.146390333E +01	J 0.305.561595
1.25	0.252934m37E+01	J 0.263777971E+LU	J• Z3 ±0 Z0 54 6€ +0 J	J 0.405740800E
1.50	0°349736500E+01	J 0.137797475E+00	C+322526150E+01	J 0.4620914726
1.75	0 • 467519951E+01	J 0.527704424E-61	v+42 /209292E+01	J 0.5564291626
2.00	0.596774292E+01	J-0.1511219616+10	0. 743254240E+01	J 0.53421745E
2.25	0~139896284E+01	J-0.3 31020534E+GO	₩+ 67823434 6E +0 1	J 0.661505938E
2 • 50	0 • 997837734£401	J —O e6 ű 8 e8 ú8 e4£ eúD	0+ 8254 31 239E +01	J 0.762014329E
2.•75	0.106616020E+02	J-0 -9 10 574853 E + C O	10+3\$1+++6384 *)	J 0.966892717E
3.00	0-124648752E+02	J-0+130197620E+01	118006077E+02	J 0°1°16261010E
3.25	0.143428211E+02	J-0°1791712816+01	. • •78846160E+01	J-0.10133.5.2E

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Table 33. Values of Forward Scattering Function at Frequency of 70 GHz. Key: 1-Diameter

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l aragerao		24411		SKEI
0•25	0.1619906765-01	J 6+612340579F-01	0+17 3444 27 25-01	J 0-596446693E-UJ
0.50	0.41006940 6E+0U	J 0+35253973E+00	Q+37=159=21E+00	J 0-343411744E+00
0 • 75	0-110859013E+01	J 0.260035217E+C0	U+103396307E+01	J 0+307750583E+00
1.00	0 • 18430233 GE+01	J 0+3655479E+0C	0. 10430227E+01	J 0.403334439E+UG
1.25	0.287842560E+01	J 0.206757963t+00	10• 2505 33 10 25 •0 1	J 0.443060398E+00
1.50	0.397529984E+01	J 0.116645873E+00	(• \$\$8044753E+01	J 3.4720559447E+00
1.75	0+53835579E+01	J-0.421462432E-01	0.4727238465 0	J 0•545367669E+00
2 • 00	0+6768137936+01	J-0- 2371863391 +00	(J 0-5731418736+00
2+25	0-842245293E+01	J-C•4799312486+00	10+ 44 th Land 2 + 11	J 0.659721351E+00
2.50	0.1018018446+02	J-0•779170215E+00	[0+241441][4+6]]	J 0.713562224E+00
2.75	0-1211442766+02	J-0+] 1465 7367 E+61	50+4445672711+1)	J 0.732676923E+00
00°E	0.141351614E+02	J-0•100022736E+01	0. 13 205 1 70 1E + 01	J 0-517222297E+06
3.25	0.162396376E+02	J-0-227 95 8 791£+01	ŭ• 15.5643932E+02	J 0.7.00960500E+00

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Table 34. Values of Forward Scattering Function at Frequency of 75 GHz. Key: 1-Diameter

SANI		0•3 c5 Q7 4694 E+00	0.302849174E+00	0.426206172E+00	0 . 416928389E+00	0.485791550E+00	0 • 5 07 9 8 0 1 • 8 6 • 0 0	0 .5 56930840E+00	0 •6 00 8 1 6 4 2 9 E + 00	0.6 06 37 05 09 E+ 0Ú	0 •6 66 410 327 E+00	0.673215806E+00	0.664316082E+00		
	5	7	7	7	7	7	٦	7	٦	7	7	7	、	,	
	0.231089400E-01	0.475550592E+00	0*115433693E+01	0+195920658E+0 L	0.301769719E+01	0.419158745E+01	0. 560517447E+01	0-7132444346+01	0•88 <i>1</i> 907959E+01	0• 10 75 42 44 0E + 02	0. 1266568665+02	0. 1489768036+02	6.1744946595+02		
(411	J 0.742075443E-G1	J 0.368358195E+00	J 0.251162529E+00	0°303917229E+60	J 0.1c03468565+00	J 0-777361393E-01	J-0•137376547E+00	J-0.335421132E+00	J-0.639205707E+00	3-0-962735057E+00	J-0*1 39963813E+01	J-0.191140183E+61	J-0"55#11596E+01	r.	
ũ	0 ~241 938 80 5E-01	0-517208040E+00	0.122890936E+01	0-2116625792+01	0=322514057E+01	J_+50749969E+0L	0.598872662E+01	0 • 764337730E+01	U.947654529E+01	0.1147873885+02	0-136242161E+02	0-1591006856402	0-1820998446+02		
L DIAMETRO	5-34				1.25	05-6	1.75	2.00	256		×	00.5	5.E		
Tab1	.e 3	5.	Val	ues	of	Forw	ard	Sca	ttei	ring	Fur	ncti	on a	t Frequency of 80 G	iz.
Key:	: 1	-Di	amet	er											

I DIAGETRO	S	SKN I I		SKKI
ء 0•25	0.316342451E-01	J 0.887627602E-01	6• 30 22 69 37 0E -0 L	J 0.865010023E-01
0.50	0.627375841E+00	J 0-369056404E+00	G. 580851747E+00	J 0.3 /3014805E+00
0.75	0.13588958E+01	J 0.253905926E+00	0. 12 81 4941 45 +0 1	J 0.310403526E+00
1.00	0•2401827815+01	J 0.277235210E+00	C.224039341E+01	J 0.427240849E+00
1.25	0*359148312E+01	J 0.133193076E+CO	U.338121510E+01	J 0**020399886+00
1.50	0 • 506637669E+01	J 0.623077671£-02	0.4747143755+01	J 0*475408018E+00
1.75	0 <u>=</u> \$68639706E+0 1	J-0.214239405E+UJ	0. 63 01 25 23 7E +0 L	J 0.46911c271E+00
2 • 00	. 0.85631370 5E+01	J-0.470204413E+60	10+3E 01110 c 04 • 1	J 0*530552506E+00
2.25	0+105912571E+02	J-0.7 87987232E+CC	C • 30 00 42 32 45 +0 2	J 0*525875449E+00
2 • 50	0.12935922E+02	J-0.11817 6651E+01	u•12ŭ375950E+0	J 0*95671486E+00
2.75	0.152 390232E+02	J-0.1 65521717E+01	0• 1+ 3935 + 6 + E + 0 +	J 0****
00°E	0.177505493E+02	j-0 •2 28 26 29 28 E + 01	U •1 695420846+02	J 0.660137694E+00
3.25	0.20219665555+02	J -0. 286739635E+0 1	0.1356462105+02	J 0-119210720E+01
		*		

Table 36. Values of Forward Scattering Function at Frequency of 85 GHz. Key: 1-Diameter

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L DIAHETRD		5KK I I		SKKI
0.25	0 • 407976806E-j1	J 0.1049082855+00	0.3996738225-01	J 0.102273107E+0(
0.50	0 ~ 734674633E+00	J 0.356537998E+00	0 ° c856 4742 85+00	J 0*368306915E+0(
0.75	0•15060901 bE+0 1	J 0.269940419E+00	U+142259072E+01	J 0-328114510E+00
1.00	0.263481350E+01	J 0°534390559E+00	C+ 252709103E+01	J 0*+00289552E+U(
1.25	0°399479003E+01	J 0.113376677E+00	0.3170233155.01	J 0.406773865E+0(
1.50	0 • 562\$94957c+01	J-0-796446204E-01	0=532414C55E+01	J 0*437623441E+0(
1.75	0°744237736E+01	J-0 • 2 94 68 85 82 E+ 00	0•703660965E+ 0 1	J 0.446529329E+U
2.00	0°950507099E+UT	J-0 •610113263E+00	0.401392291E+01	J 0*466841161E+0(
2.25	0,117825747E+02	J-0+955615699E+00	U•111676245E+0 2	J 0.4407875756+00
2.50	0 -1+258979 8E+02	J-0 •1 399 35875 E+61	0 a 13 365 E 26 4E +02	J 0 •5 18 26 7393 E+00
ĉ. 15	0.1692385926+02	J-0-1 9508C376E+GI	U•161594570E+02	J 0*21909*408E+00
3.00	0•196363525E+02	J-0.257453728±+01	0. 1584 23 46 2E+0 2	J 0.843296149E+J(
3.25	0•22315994 3E+02	J-0.311£09393E+01	0.22U712433E+02	J 0.432319105E+00
		•		•

Table 37. Values of Forward Scattering Function at Frequency of 90 GHz. Key: 1-Diameter

2.1.1

J 0-398890674E+00 J 0.31796965656+00 J 0.2 16 65422E+00 J 0.193165302E+01 J 0.468673644E+00 J 0.391252519E+00 J 0.416"31633E+U0 J 0.344702673E+G0 J 0.431563020E+00 J 0.119592547E+00 J 0.354297101E+00 J 0.350.542724E+00 J 0.3 60 270560 E+00 IV XS 0. 2324.89014E+02 0+ 18182812E+01 0.1504552946+02 U. 1791 5977 35 +02 0+213143605E+02 0. 745A7+009E+00 1. 591076088E+01 0+100124102E+02 U+124309425E+U2 Le 29,119,3936+01 U. 414752 1956+01 0-4960316795-01 0. [5825231]E+0] J-U-4019654995 + 00 J-0.349890327E+01 J 0.122010410E+C0 J 0.285704434c+00 J 0.1895779976+00 J 0.917244053e-01 J-0+156345546E+U0 J-0.741912186c+60 J-0.114894390E+U1 J-0.162663641E+01 J-0-225298023E+01 J-0-286126900E+01 J 0.3352426296+0 SKKII 0.247220306E+02 0.8352714186+00 0.10.4959707E+02 0 • 1 8 6 6 2 4 4 5 1 E • 0 2 0.6205996516+01 0+8240428656+01 0+130195370E+02 0+157508659E+02 0.216236725E+02 0-513407503E-01 0-1674157145+01 0.2962592592+01 0.443544483E+01 DIANETRO 2.50 3.00 1.50 1.75 2.23 2.e.75 3.25 0.50 1.00 1.25 2.00 0.25 0.75

Values of Forward Scattering Function at Frequency of 95 GHz. Table 38. 1-Diameter Key:

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J 0.2247391346+00 J 0.3378301866+00 J 0.251493990E+00 J 0.253106534E+00 J 6.3547645546+00 J 0.361275911E+U0 00+3761910-6+0 L J-0-4963245316-01 0.133397992E+00 J 0.4335357429E+00 J 0.3 70523572E+CC J 0+3111222411E+00 J 0.254860869E+00 ~ U. 268552872E+02 0. 19.8556497E+02 J. 229228058E+02 0+ 651271725E+01 0. 137451191E+02 0. 166553497E+02 0+ 5195 324802+00 0.]?62458345+01 0. 55 -2967 56-01 5.4056 13 13 UE -01 G. 85-5221714E+01 0.1105104986+02 0. c2 -9 8288 4E -0 1 J-G=222455437E+00 J-0.525216281C+00 J-0.383 087218E+00 J-0-198562775E+01 J-0.314304256E+01 1-0*3+860 60 96 E+01 J G.1413135172+JO 0_295465026E+00 J Č.155023730E+GJ J-0.133882141E+01 J-0.257758904E+01 0-3102827546+00 J 0.2776831761-01 **SKALL** ~7 0. 26991 165 2E+02 0. 17528308 1E+02 0.92792985556~00 0. 489798927E+01 0.68 151502 6E+01 0-9058842666401 0.215464315E+02 0+1430104736+02 0-2048028146+02 n.236419983E+02 0.5534459336-01 0-108232376E-01 0-3242128376+01 L DLANETZD 2.50 0.25 0..50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.75 3.00 3.25

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Values of Forward Scattering Function at Frequency of 100 GHz. Table 39. 1-Diameter Key:

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Table 40. Values of the Parameters Ψ and α for Various Types of Polarization Key: 1--Linear horizontal, 2-Linear, bisector I and III quadrant, 3-Circular left, 4-Linear, bisector II and IV quadrant, 5-Circular right, 6-Linear vertical.

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Table 41

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Key: 1-Frequency

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