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Assuming that in each point of the sky the diference between the directions of polarization at the two frequencies is due to the difference of the Faraday rotation, we can eliminate the Faraday rotation altogether. The fan shape then makes place for a field aligned roughly along the galactic plane.

The beginning space research effort at Leiden holds a close conection to these problems. The synchrotron emission gives the product H N_e where H is the magnetic field strength and N_e is the number of relativistic electrons. The cosmic-ray experiment in preparation for OGO-E may give N_e itself. The combination of these will then teach us more about the magnetic field.

4. The large antenna project. This project, formerly known as the Benelux Cross Antenna project is now in the stage that the construction work on the antennas will begin. The present design is different from the one that has been published. It has 10 mirrors of 25-meter diameter fixed at intervals of 150 meters along an East-West line. The output of each of these is correlated with the output of one other mirror on tracks at the end of the same line. This gives 10 Fourier components simultaneously. Further Fourier components are obtained consecutively (a) by the earth's rotation and (b) by shifting the mirrors on tracks. By special arrangement Belgian astronomers will take part in the observations.

The chose wavelength is 21-cm, partly because of hopes that a shift to line observations may be made in later years, but partly because we were forced to go to the only spectrum band where protection against interference could be guaranteed. The fight for sufficient protection of radio astronomy bands which gave somewhat gratifying results at the 1959 conference of the International Telecomunications Union, must go on. The radio astronomers in the Latin American countries should realize that their work in these matters can be very weighty and that it is important to convince the administrations in their own countries of the vital necessity of such protection for radio astronomy.

MULTIPLE SCATTERING IN PLANE ATMOSPHERE

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Studies on multiple scattering and radiative transfer began early in this century by the work of Schwarzschild, Milne, and Eddington. In the 1950's the important books of Chandrasekhar, Kourganoff and Sobolev on this subject appeared.

In spite of the fact that almost all important questions in this very classical problem have now been solved, it often takes long to obtain the numerical answer to a simple question. For that reason I stated some years ago to prepare a book which should contain many tables and graphs together with a condensed text. In the course of this work it was found useful to deviate from normal usage in some respects, which I shall briefly review.

1. Definitions. The reflection function R (a,b,μ_0,μ) and the transmission function T (a,b,μ_0,μ) are defined as simple ratios in a physical definition. Similarly, a new concept, the point-direction gain G (a,b,μ,τ) is introduced the definition of which is almost identical to the definition of gain in antenna theory. It is related to Sobolev's escape probability but is better suited to bring out the reciprocity relations. It is important to see that these physical definitions do not only have heuristic value but can be made the basis for exact derivations and computer programs.

2. Method of successive scattering. This direct method, which consists of summing the Neuman series, which solves the Milne integral equation, is not impractical but can be quite well used up to total depth 3 or 4 with a fast computer. In that case several hundred successive scatterings have to be summed in order to reach five-figure accuracy.

3. Doubling method. Results for even thicker layers cannot easily be obtained by adding very thin layers as Ambartsumian has first done. We found it more useful to add equally thick layers, which results in doubling the thickness b. Again an infinite series is obtained but the computations remain simple because convergence is fast and the second eigenvalue is so small that the series can soon be broken off and be replaced by a geometric series. This method has the great advantage that it is equally simple for anasotropic as it is for isotropic scattering.

4. Additions and improvements have been made in many further details. It is hoped to finish the manuscript this year. The obvious applications should be in the field of planetary atmospheres but also in many physical and chemical problems on a terrestrial scale.