

126

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10

N91-27642

## REFERENCE MODELS FOR THERMOSPHERIC NO

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Nitric oxide has been measured with an ultraviolet spectrometer on the polar-orbiting satellite Solar Mesosphere Explorer (SME) for the period January 1982 to August 1986. The nitric oxide database contains densities at all latitudes sorted into 5°-bins and at altitudes between 100 and 140 km sorted into 3.3-km-bins. The largest densities occur at latitudes in the auroral zones where the density varies as a function of geomagnetic activity. Variations of a factor of 10 occur between times of intense activity and quiet times. At low latitudes, the nitric oxide density at 110 km varies from a mean value of  $3 \times 10^7$  molecules/cm<sup>3</sup> in January 1982 to a mean value of  $4 \times 10^6$  molecules/cm<sup>3</sup> during solar minimum conditions in 1986. In addition, the low-latitude nitric oxide density varies  $\pm 50\%$  with a period of 27 days during times of high solar activity.

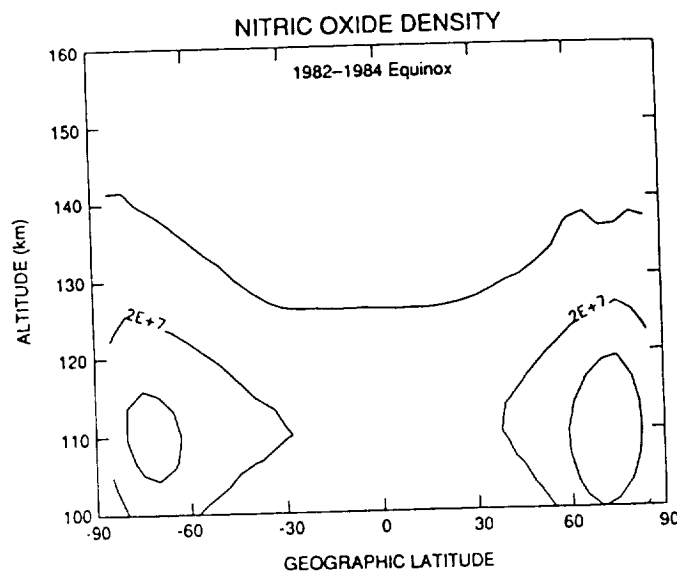


Figure 1. Nitric oxide density for the 1982-1984 equinox periods as a function of geographic latitude and altitude. Observations for the periods March 7 to April 2 and September 10 to October 6 for the years 1982, 1983, and 1984 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 1. NO Density ( $\times 10^4$  molecules/ $\text{cm}^3$ )

Alt	Geographic Latitude																		
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	1	2	2	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1
157	3	2	4	4	3	3	3	4	3	1	1	1	1	1	1	1	1	1	1
153	3	4	5	5	5	3	5	5	5	4	4	4	3	1	1	1	1	1	2
150	5	7	7	7	7	6	6	6	4	5	5	5	5	4	5	4	3	3	3
147	10	9	8	8	8	8	8	7	7	5	4	4	4	4	4	4	4	4	4
143	10	10	9	8	8	8	8	7	6	6	5	5	4	4	4	4	4	4	4
140	10	10	10	9	9	9	8	7	6	6	5	5	4	4	4	4	4	4	4
137	11	12	11	11	10	9	9	8	7	6	6	5	5	5	5	5	5	5	5
133	12	14	13	12	11	11	10	9	8	7	7	6	6	6	6	6	6	6	6
130	14	16	15	15	14	13	12	11	10	9	8	8	7	7	7	7	7	7	7
127	17	19	19	18	16	15	14	13	12	11	10	10	9	10	9	9	10	9	10
123	19	22	22	21	20	19	17	16	15	14	13	12	12	12	12	12	12	12	12
120	22	26	26	25	24	22	20	19	18	17	16	15	15	15	15	15	15	15	15
117	27	29	29	29	27	25	23	22	20	19	18	18	18	18	18	17	17	17	17
113	24	30	32	31	30	28	25	24	22	21	20	20	19	19	19	19	19	19	18
110	24	30	33	33	31	29	26	24	22	21	21	20	20	20	20	20	20	19	19
107	22	29	31	32	31	28	25	23	21	20	20	19	19	19	19	19	18	18	18
103	18	25	28	29	28	25	23	21	19	18	17	17	16	16	16	16	16	16	16
100	14	20	24	25	24	21	19	17	15	14	14	13	13	13	13	13	13	12	12

Alt	Geographic Latitude																		
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
160	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1
157	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
153	2	2	3	3	2	1	2	3	1	2	2	1	1	1	1	1	2	1	5
150	3	3	3	3	3	3	4	4	3	3	3	2	3	5	4	6	7	7	7
147	4	4	4	5	4	4	4	5	4	6	6	6	6	7	8	8	8	7	7
143	4	4	5	4	4	5	5	5	6	7	6	6	8	8	8	8	8	8	8
140	4	5	5	5	5	5	5	6	6	7	7	7	8	9	9	9	9	8	8
137	5	5	5	5	5	6	6	7	7	7	8	9	10	11	10	10	11	10	11
133	6	6	6	6	6	7	7	8	8	8	9	10	11	12	13	14	15	16	14
130	7	7	8	8	8	8	8	9	10	10	11	12	13	15	16	17	19	20	18
127	9	9	10	9	10	10	10	11	12	12	13	15	16	17	19	20	18	16	16
123	12	12	12	12	12	12	13	13	14	15	16	18	20	21	23	24	22	19	19
120	15	14	14	14	14	15	15	16	17	18	19	21	23	26	28	29	26	22	22
117	17	17	17	17	16	17	17	18	19	20	21	23	26	29	34	37	37	33	27
113	18	18	18	18	18	18	19	19	20	21	23	26	29	34	37	37	33	27	27
110	19	19	18	18	18	18	19	19	20	22	24	27	31	35	39	38	34	27	27
107	18	18	17	17	17	17	18	18	19	21	23	26	30	35	38	37	33	26	26
103	16	15	15	15	15	15	15	16	17	18	21	24	28	33	35	34	29	23	23
100	12	12	12	12	11	12	12	12	13	15	17	20	24	28	30	28	24	19	19

Table 1. Nitric oxide density for the 1982-1984 equinox periods as a function of geographic latitude and altitude. Observations for the periods March 7 to April 2 and September 10 to October 6 for the years 1982, 1983, and 1984 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

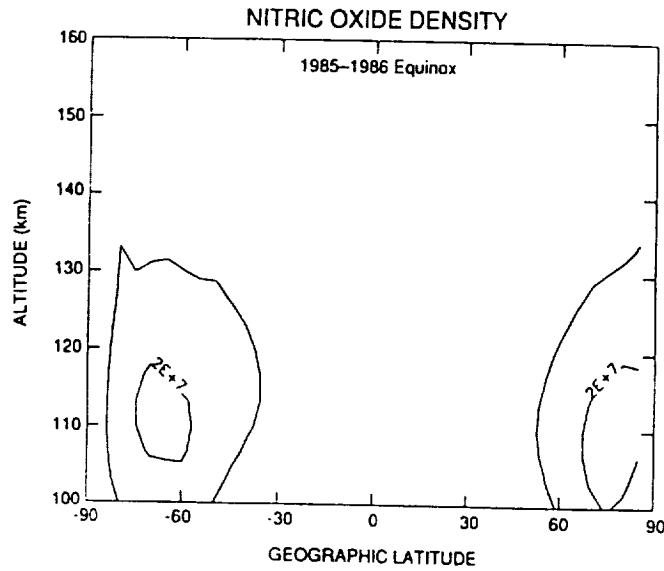


Figure 2. Nitric oxide density for the 1985-1986 equinox periods as a function of geographic latitude and altitude. Observations for the periods March 7 to April 2 of 1985 and 1986 and September 10 to October 6 for the year 1985 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 2. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )

Altitude	Geographic Latitude																		
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	2	2	2	2	3	0	0	0	0	0	0	0	0	0	0	1	1
147	0	3	2	2	3	3	3	3	2	1	1	0	1	0	3	1	2	2	2
143	0	3	6	8	6	5	4	5	5	2	1	4	2	2	3	3	3	3	2
140	0	8	8	7	8	7	6	7	8	6	4	3	3	3	3	3	3	3	3
137	3	9	8	8	8	8	7	7	7	6	5	4	4	3	3	3	3	3	3
133	3	10	8	9	9	9	8	8	7	7	6	5	4	4	4	4	3	3	3
130	3	11	10	11	11	10	10	10	10	8	8	6	6	5	5	4	4	4	4
127	4	12	12	13	13	12	11	11	10	9	7	7	6	5	5	5	5	5	5
123	5	13	14	16	16	14	13	12	11	10	8	7	7	6	6	6	6	6	5
120	6	15	17	19	18	17	15	14	12	11	9	8	8	7	7	7	7	6	6
117	6	17	19	21	21	19	17	15	13	11	10	9	8	8	7	7	7	6	6
113	7	18	20	22	22	21	18	15	13	11	10	9	8	8	7	7	7	6	6
110	7	17	20	22	22	22	19	15	12	11	9	9	8	7	7	7	7	6	6
107	7	16	18	21	21	21	18	14	11	9	8	7	7	7	6	6	5	5	5
103	6	13	16	18	18	18	19	17	12	9	7	6	6	5	5	5	5	4	4
100	5	10	12	14	15	16	14	10	7	5	4	4	4	4	3	3	3	3	3
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
150	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
147	2	1	1	1	2	1	2	1	2	2	1	0	1	0	1	0	1	0	0
143	2	3	2	2	2	2	2	2	5	6	2	3	4	1	1	2	4	3	3
140	3	3	3	3	2	3	2	3	4	5	6	6	7	6	5	4	5	5	5
137	3	3	3	3	3	3	3	3	4	5	4	5	7	7	7	8	8	9	9
133	3	3	3	3	3	3	3	3	4	5	5	5	7	7	8	9	9	10	10
130	4	4	4	4	4	4	4	4	5	5	5	6	7	8	10	10	11	12	12
127	5	5	4	4	4	4	4	4	5	5	5	6	6	8	10	11	12	13	14
123	5	5	5	5	5	5	5	5	6	6	6	7	9	11	13	16	18	19	19
120	6	6	6	6	6	6	6	6	6	7	7	9	11	13	16	18	19	19	19
117	6	6	6	6	6	6	6	6	6	7	7	8	10	12	15	19	21	22	21
113	6	6	6	6	6	6	6	6	7	7	8	9	11	14	17	21	24	24	22
110	6	6	6	6	6	6	6	6	7	7	8	9	11	14	18	22	26	25	22
107	5	5	5	5	5	5	5	5	6	6	7	7	8	11	14	18	22	26	24
103	4	4	4	4	4	4	4	4	5	5	6	6	7	10	13	17	21	24	22
100	3	3	3	3	3	3	3	3	4	5	6	6	8	11	15	18	21	18	14

Table 2. Nitric oxide density for the 1985-1986 equinox periods as a function of geographic latitude and altitude. Observations for the periods March 7 to April 2 of 1985 and 1986 and September 10 to October 6 for the year 1985 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

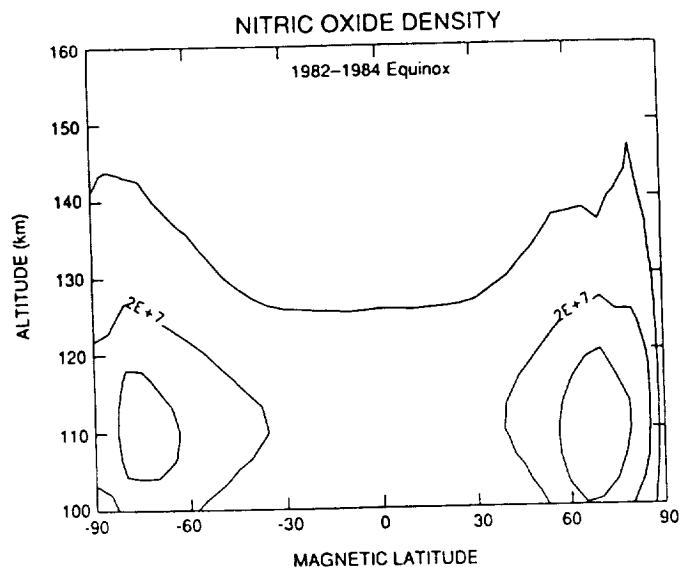


Figure 3. Nitric oxide density for the 1982-1984 equinox periods as a function of geomagnetic latitude and altitude. Observations for the periods March 7 to April 2 and September 10 to October 6 for the years 1982, 1983, and 1984 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 3. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )

Alt	Geomagnetic Latitude																		
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	1	1	2	2	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1
157	1	3	2	2	3	4	4	4	3	1	1	1	1	1	1	1	1	1	1
153	3	3	4	4	5	5	5	5	6	5	4	4	4	3	1	1	1	2	1
150	5	7	6	9	7	7	7	7	6	5	4	4	5	5	5	4	3	3	2
147	8	8	8	10	9	8	8	7	6	5	5	4	4	4	4	4	4	4	4
143	10	10	10	10	9	9	8	7	6	5	5	4	4	4	4	4	4	4	4
140	10	11	11	11	10	9	9	8	7	6	5	5	4	4	4	4	4	4	4
137	11	12	12	12	11	10	10	9	7	6	5	5	5	5	5	5	5	5	5
133	12	13	14	14	12	12	11	10	9	8	6	6	6	6	6	6	6	6	6
130	14	15	17	17	15	14	13	12	10	9	8	7	7	7	7	7	7	7	7
127	16	17	20	20	18	16	15	14	13	11	10	10	9	9	9	9	9	9	9
123	19	20	24	24	21	20	18	17	15	14	13	12	12	12	12	12	12	12	12
120	21	22	28	28	25	24	22	20	18	17	16	15	15	15	15	14	14	14	14
117	24	25	31	31	29	27	25	23	21	20	19	18	17	17	17	17	17	17	17
113	25	26	34	34	32	30	27	25	23	22	20	20	19	19	19	19	19	19	19
110	25	26	34	34	33	31	28	26	24	22	21	20	19	19	19	19	19	19	19
107	22	25	33	33	32	30	28	25	23	21	20	19	18	18	18	18	18	18	18
103	20	22	29	29	29	28	25	22	20	19	17	16	16	16	16	16	16	16	16
100	16	17	24	24	25	23	21	19	17	15	14	13	12	12	13	13	13	13	12
160	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
157	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0
153	1	2	3	3	2	3	2	1	2	2	3	2	1	1	1	1	1	5	2
150	2	3	3	3	3	4	4	5	3	4	4	4	3	5	4	6	8	2	0
147	4	4	4	4	5	5	5	6	4	6	7	7	8	8	8	8	11	8	2
143	4	4	4	4	5	5	5	6	7	7	8	9	9	9	9	11	12	9	2
140	4	4	5	5	5	5	5	6	7	7	8	9	10	11	11	10	11	12	10
137	5	5	5	5	5	6	6	6	7	8	9	10	11	12	13	13	13	11	2
133	6	6	6	6	6	6	7	7	8	9	10	11	12	13	14	15	16	15	2
130	7	7	7	8	8	8	8	9	10	11	12	13	14	15	16	17	18	16	3
127	9	9	9	9	9	10	10	11	12	13	14	16	17	19	22	24	25	22	3
123	12	12	12	12	12	12	12	13	14	16	17	18	20	23	25	29	30	26	3
120	14	14	14	14	14	14	15	16	17	18	20	23	25	29	33	34	30	28	3
117	17	17	16	16	16	16	17	18	19	20	22	24	28	32	37	38	33	29	3
113	19	18	18	18	18	18	18	18	19	20	22	25	29	34	38	39	34	29	3
110	19	18	18	18	18	18	18	19	20	22	25	29	34	38	39	34	29	21	3
107	18	18	17	17	17	17	17	18	19	21	24	28	33	38	38	33	28	20	3
103	16	15	15	15	15	15	15	16	17	19	22	26	31	35	34	30	24	18	2
100	12	12	12	11	11	12	12	12	13	15	18	22	26	30	29	25	20	15	2

Table 3. Nitric oxide density for the 1982-1984 equinox periods as a function of geomagnetic latitude and altitude. Observations for the periods March 7 to April 2 and September 10 to October 6 for the years 1982, 1983, and 1984 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

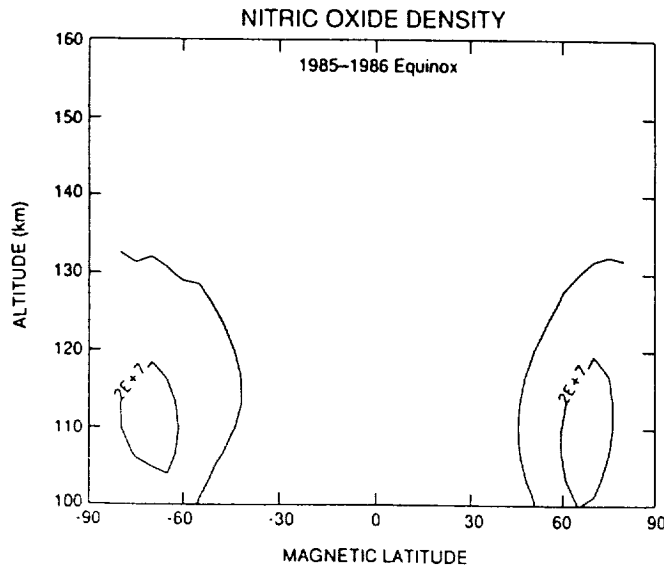


Figure 4. Nitric oxide density for the 1985-1986 equinox periods as a function of geomagnetic latitude and altitude. Observations for the periods March 7 to April 2 of 1985 and 1986 and September 10 to October 6, 1985, are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

**Table 4. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )**

*Geomagnetic Latitude*

Alt	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	2	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	2	2	3	3	3	3	2	1	0	1	0	2	2	2	2	2	2	2	1
143	2	3	5	5	4	5	5	1	1	3	2	3	3	3	3	3	3	3	3
140	4	7	8	7	6	6	8	5	3	3	3	3	3	3	3	3	3	2	3
137	9	8	8	8	7	7	7	6	5	4	4	3	3	3	3	3	3	3	3
133	10	9	9	9	8	8	7	6	6	5	4	4	3	3	3	3	3	3	3
130	11	11	11	10	9	9	8	7	6	5	5	4	4	3	3	3	3	3	3
127	12	13	13	12	11	11	9	8	7	6	6	5	5	5	5	5	5	5	5
123	15	16	16	15	13	12	11	9	8	7	7	6	6	6	6	6	6	6	6
120	17	19	19	17	15	14	12	10	9	8	7	7	7	7	7	7	7	7	7
117	19	21	21	20	17	15	13	11	9	9	8	7	7	7	7	7	7	7	7
113	20	22	23	22	19	15	13	11	9	9	8	7	7	7	7	7	7	7	7
110	20	22	23	22	19	15	12	10	9	8	8	7	7	7	7	7	7	7	7
107	18	21	21	22	18	14	11	9	8	7	7	7	7	7	7	7	7	7	7
103	16	18	19	20	17	12	9	7	6	6	5	5	5	5	5	5	5	5	5
100	12	14	15	16	14	9	7	5	4	4	4	4	4	3	3	3	3	3	3
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150	1	1	1	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0	2
147	1	1	1	1	2	1	1	2	3	1	1	0	0	1	0	0	0	0	2
143	3	2	3	2	3	2	3	5	6	2	4	3	3	4	4	2	2	2	2
140	3	3	3	3	3	2	3	4	5	2	6	5	5	4	4	7	8	8	8
137	3	3	3	3	3	3	3	4	4	4	6	6	6	6	8	6	8	8	8
133	3	3	3	3	3	3	4	4	5	5	6	7	8	9	9	10	9	9	9
130	4	4	4	4	4	4	4	5	5	5	6	7	9	10	11	11	11	11	11
127	5	4	5	4	4	5	5	5	6	7	9	10	12	14	13	12	12	12	12
123	5	5	5	5	5	5	5	6	6	7	8	10	12	15	17	16	13	13	13
120	6	6	6	6	6	6	6	7	7	8	10	12	15	18	20	18	14	14	14
117	6	6	6	6	6	6	7	7	8	9	11	14	17	21	22	20	16	16	16
113	6	6	6	6	6	7	7	8	8	10	12	16	19	23	25	21	16	16	16
110	6	6	6	6	6	6	7	8	8	10	13	16	20	25	25	21	16	16	16
107	5	5	5	5	6	6	6	7	8	9	12	16	20	25	25	20	15	15	15
103	4	4	4	4	4	5	5	6	7	8	11	15	19	23	22	17	13	13	13
100	3	3	3	3	3	3	4	5	5	7	9	13	17	20	19	14	10	10	10

Table 4. Nitric oxide density for the 1985-1986 equinox periods as a function of geomagnetic latitude and altitude. Observations for the periods March 7 to April 2 of 1985 and 1986 and September 10 to October 6, 1985, are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

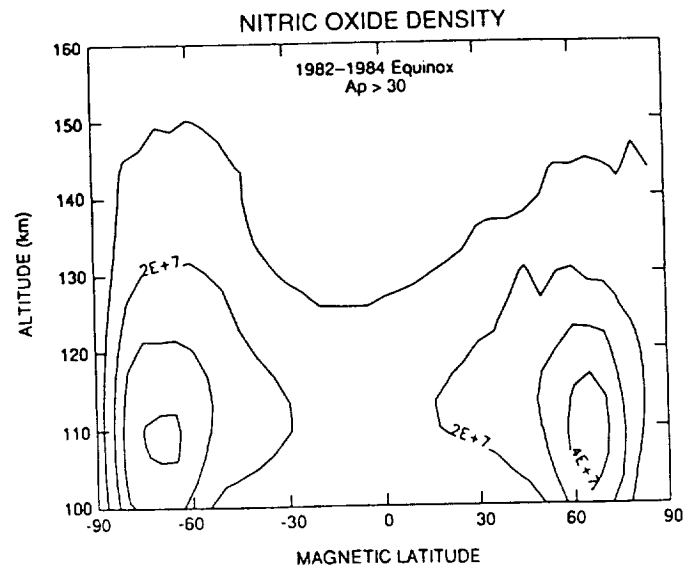


Figure 5. Nitric oxide density for the 1982-1984 equinox periods as a function of geomagnetic latitude and altitude for days when  $A_p > 30$ . Observations for the periods March 7 to April 2 and September 10 to October 6 for the years 1982, 1983, and 1984 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 5. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )

Alt	Geomagnetic Latitude																		
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	0	0	1	1	2	2	2	0	0	0	0	0	0	0	0	1	1	1	0
157	0	2	1	1	3	3	3	4	3	1	1	1	1	1	1	1	1	1	1
153	0	2	3	3	3	5	4	5	5	4	4	3	3	3	3	1	1	1	1
150	0	1	5	7	9	8	10	9	7	6	5	5	4	4	4	3	3	1	1
147	0	4	9	10	12	13	13	12	11	7	5	5	5	6	5	5	5	2	3
143	2	6	11	13	14	14	14	13	12	11	8	6	5	5	5	5	6	4	4
140	2	7	12	14	15	15	16	15	13	11	8	7	5	5	5	5	5	4	4
137	2	7	13	16	16	17	17	16	15	12	9	8	5	6	5	5	5	5	5
133	2	8	15	18	18	18	19	18	17	14	10	9	8	7	6	6	6	6	6
130	2	9	17	20	20	21	21	20	19	15	12	11	9	8	7	7	7	7	8
127	2	11	20	24	23	24	24	23	21	17	15	13	11	11	9	9	9	9	10
123	2	13	23	28	27	28	27	25	23	20	17	15	14	13	12	12	12	12	13
120	2	15	27	32	32	32	30	28	25	22	20	18	16	16	14	14	14	15	15
117	2	17	31	36	36	36	33	30	27	24	22	20	19	18	17	17	17	17	17
113	3	18	34	39	39	39	36	31	27	24	23	21	20	19	18	18	18	19	19
110	3	19	36	40	41	41	36	31	26	24	23	21	20	19	19	19	19	19	19
107	3	18	36	40	41	41	35	29	24	23	22	20	19	17	18	18	18	18	18
103	3	17	33	37	38	38	31	25	21	20	19	17	16	15	16	16	16	16	15
100	2	14	29	32	33	33	26	20	17	16	15	13	13	11	12	13	12	12	12
160	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
157	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1
153	1	1	1	2	2	2	1	1	1	1	2	2	2	1	2	1	1	1	2
150	1	2	1	2	3	4	3	4	2	1	4	2	2	5	3	4	6	2	
147	3	3	3	4	4	4	4	5	4	6	7	8	5	9	8	9	10	8	
143	4	4	3	5	6	6	5	6	9	6	9	11	11	11	10	10	11	10	
140	4	4	5	5	6	7	7	7	8	7	10	12	13	12	11	11	12	11	
137	5	5	6	7	8	8	10	10	10	11	12	14	16	13	13	12	13	13	
133	6	6	7	8	9	10	11	13	16	17	16	18	17	16	15	15	14	14	
130	8	8	9	10	11	12	13	15	18	21	18	20	21	19	17	17	16	15	
127	10	11	11	12	13	14	16	17	20	24	20	24	25	22	24	19	17	16	
123	13	13	14	15	15	17	18	19	23	26	26	27	29	28	28	22	19	17	
120	15	16	16	17	18	19	21	21	25	26	28	30	33	38	40	37	28	22	
117	17	18	18	19	20	21	22	23	26	28	30	33	38	40	37	28	22	17	
113	19	19	19	20	21	22	23	23	26	28	31	35	42	44	40	31	23	17	
110	19	19	19	20	21	22	22	25	27	30	36	43	47	42	32	23	16		
107	18	18	18	18	19	20	20	23	24	28	35	43	47	41	32	21	15		
103	15	15	15	15	16	16	17	17	19	21	25	32	39	43	38	30	19	13	
100	12	12	11	12	12	13	13	13	15	16	20	27	34	37	32	27	15	10	

Table 5. Nitric oxide density for the 1982-1984 equinox periods as a function of geomagnetic latitude and altitude for days when  $A_p > 30$ . Observations for the periods March 7 to April 2 and September 10 to October 6 for the years 1982, 1983, and 1984 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

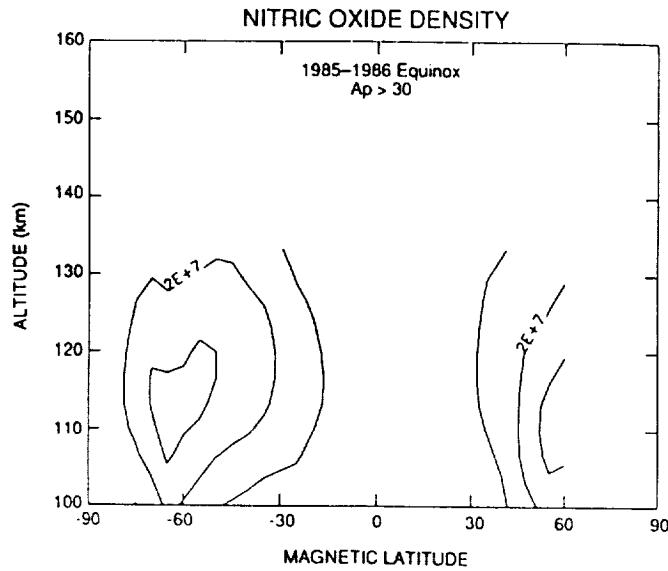


Figure 6. Nitric oxide density for the 1985-1986 equinox periods as a function of geomagnetic latitude and altitude for days when  $A_p > 30$ . Observations for the periods March 7 to April 2 of 1985 and 1986 and September 10 to October 6, 1985, are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

**Table 6. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )**

Alt	Geomagnetic Latitude																		
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	8	10	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	8	11	13	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	8	12	14	15	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0
137	9	14	15	16	15	15	0	16	14	11	8	0	4	3	0	3	0	3	0
133	10	15	17	17	17	18	19	18	16	13	10	7	6	4	3	3	2	2	2
130	12	17	19	18	20	21	22	21	19	16	13	9	7	5	4	3	3	3	2
127	14	20	23	21	23	25	26	24	22	19	15	11	9	6	5	3	3	3	3
123	16	22	26	24	26	29	28	26	24	22	17	13	11	8	5	4	3	3	3
120	18	24	29	27	29	31	30	27	25	23	18	14	12	9	5	4	3	3	3
117	18	25	31	31	31	32	30	27	25	23	19	15	12	9	5	4	3	3	3
113	18	24	31	33	32	32	28	25	24	21	17	14	11	9	5	4	3	3	3
110	17	22	28	33	31	29	25	23	21	18	15	13	10	8	5	4	3	3	3
107	15	18	24	31	28	25	21	18	17	14	12	11	8	7	4	4	4	4	4
103	12	14	19	28	24	20	16	14	12	10	9	8	6	5	4	3	3	3	3
100	9	10	13	22	19	14	11	9	7	5	5	6	4	3	3	2	2	2	2
160	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	2	2	2	2	2	3	4	7	0	0	0	0	0	0	0	0	0	0	0
133	2	3	2	2	3	3	5	9	10	11	17	0	0	0	0	0	0	0	0
130	3	3	2	3	3	4	6	10	11	13	16	16	19	0	0	0	0	0	0
127	3	3	3	4	4	5	7	11	12	15	19	19	23	0	0	0	0	0	0
123	3	4	3	4	5	6	8	12	13	16	22	22	26	0	0	0	0	0	0
120	3	4	4	5	6	6	8	13	14	17	24	26	30	0	0	0	0	0	0
117	4	4	4	5	6	6	9	13	14	19	27	30	32	0	0	0	0	0	0
113	4	4	4	5	6	6	8	12	14	20	28	32	34	0	0	0	0	0	0
110	4	4	4	5	6	5	8	10	13	20	28	33	33	0	0	0	0	0	0
107	4	3	4	4	5	4	6	8	12	19	26	32	31	0	0	0	0	0	0
103	3	2	3	3	4	3	5	6	10	17	23	29	27	0	0	0	0	0	0
100	2	2	2	2	3	2	4	4	7	14	19	24	22	0	0	0	0	0	0

Table 6. Nitric oxide density for the 1985-1986 equinox periods as a function of geomagnetic latitude and altitude for days when  $A_p > 30$ . Observations for the periods March 7 to April 2 of 1985 and 1986 and September 10 to October 6, 1985, are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

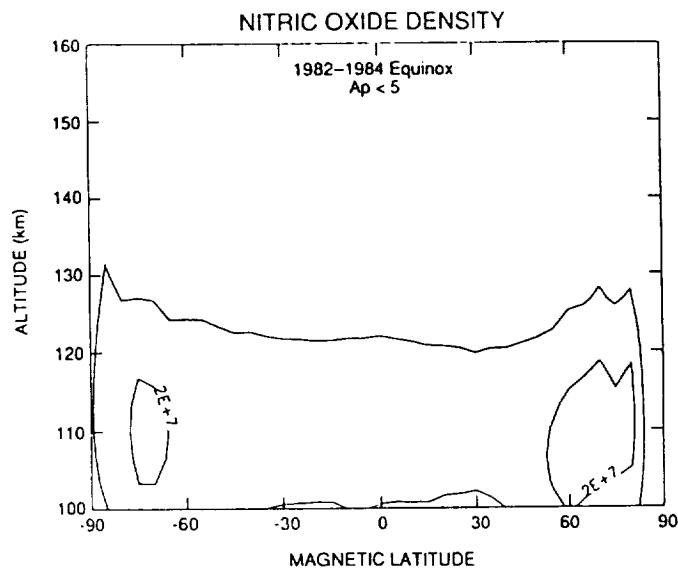


Figure 7. Nitric oxide density for the 1982-1984 equinox periods as a function of geomagnetic latitude and altitude for days when  $A_p < 5$ . Observations for the periods March 7 to April 2 and September 10 to October 6 for the years 1982, 1983, and 1984 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 7. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )

Alt	Geomagnetic Latitude																		
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
157	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
153	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
150	1	4	2	2	2	3	3	2	2	1	1	2	2	1	1	2	1	1	1
147	3	4	5	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2
143	3	5	5	5	4	4	4	4	4	3	3	3	3	3	3	3	3	3	2
140	3	7	6	5	5	5	4	4	4	3	3	4	3	3	3	3	3	3	3
137	3	8	6	5	5	5	5	4	4	4	4	4	3	4	3	3	4	4	4
133	4	9	7	6	6	5	5	5	5	4	4	4	4	4	4	4	4	4	4
130	5	11	8	8	8	6	7	6	6	5	6	5	5	5	5	5	5	5	5
127	5	12	10	10	10	8	8	8	8	7	7	7	7	7	7	7	7	7	7
123	6	14	12	14	13	11	11	11	11	10	9	9	9	9	9	9	9	9	9
120	7	16	14	17	16	13	13	13	12	12	12	11	11	11	11	11	11	11	11
117	8	17	16	20	19	16	16	15	15	14	14	13	13	13	13	13	13	13	13
113	9	18	17	22	22	18	18	17	16	16	15	15	15	14	14	14	15	15	15
110	9	17	17	23	23	19	19	18	17	16	16	15	15	15	15	15	15	15	15
107	8	15	16	22	22	19	19	17	16	16	15	14	14	14	14	14	15	15	14
103	7	13	14	20	20	17	17	15	15	14	13	13	12	12	12	12	13	13	12
100	5	10	11	16	17	14	14	12	12	11	10	10	9	9	9	9	10	10	9
160	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
157	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
153	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
150	1	1	2	2	2	1	1	1	1	1	2	2	1	2	3	1	1	1	0
147	2	3	3	3	2	2	2	2	2	2	3	3	3	2	3	2	3	1	0
143	2	3	3	3	3	3	3	3	2	2	4	3	3	3	3	3	3	3	0
140	3	3	3	3	3	3	3	3	3	3	3	3	4	3	4	4	4	3	0
137	4	4	3	3	3	4	3	3	4	3	4	4	4	5	4	5	5	5	1
133	4	4	4	4	4	4	4	4	4	4	5	4	4	5	7	6	6	1	1
130	5	5	5	5	5	5	5	5	5	5	5	6	7	9	7	8	1	1	1
127	7	7	7	7	6	7	6	7	6	7	7	7	9	9	11	9	11	2	2
123	9	9	9	8	8	8	8	8	8	9	9	9	12	13	14	13	15	3	3
120	11	11	11	11	10	10	10	10	10	11	11	12	15	17	19	16	19	4	4
117	13	13	13	12	12	12	12	12	12	13	14	16	18	20	22	19	21	5	5
113	15	14	14	14	13	13	13	13	14	14	16	19	22	23	24	21	23	6	6
110	15	15	14	14	14	13	13	14	14	15	18	21	24	24	25	23	23	6	6
107	14	14	14	14	13	13	12	13	14	15	18	22	25	24	24	22	21	6	6
103	12	12	12	12	11	11	11	11	12	14	17	21	24	22	21	21	18	5	5
100	9	9	9	9	9	9	8	9	10	12	15	18	21	19	17	17	14	5	5

Table 7. Nitric oxide density for the 1982-1984 equinox periods as a function of geomagnetic latitude and altitude for days when  $A_p < 5$ . Observations for the periods March 7 to April 2 and September 10 to October 6 for the years 1982, 1983, and 1984 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .



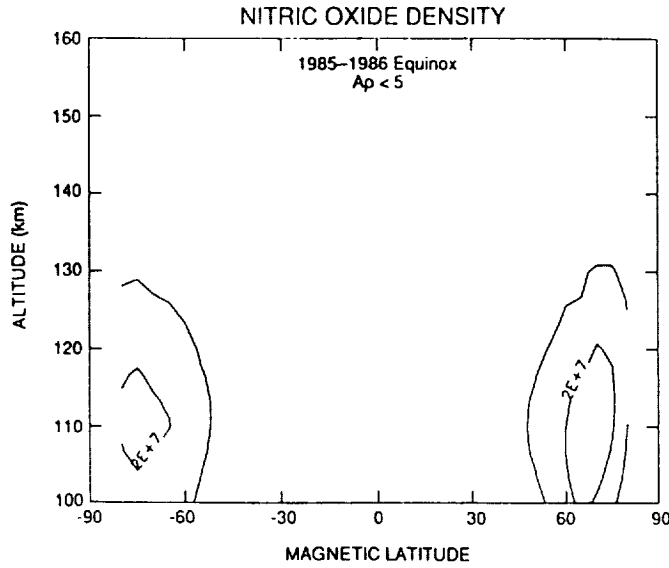


Figure 8. Nitric oxide density for the 1985-1986 equinox periods as a function of geomagnetic latitude and altitude for days when  $A_p < 5$ . Observations for the periods March 7 to April 2 of 1985 and 1986 and September 10 to October 6, 1985, are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 8. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )

Alt	Geomagnetic Latitude																		
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
147	2	2	2	1	1	0	0	1	0	1	0	1	0	2	1	1	2	1	1
143	1	2	3	2	2	0	1	1	1	1	2	2	3	2	3	2	2	2	2
140	3	4	4	4	4	2	1	1	2	1	3	3	3	3	3	3	2	3	3
137	4	6	6	6	5	5	6	2	3	3	3	3	3	3	3	3	3	3	3
133	8	7	7	7	6	6	5	4	5	3	3	3	3	3	3	3	3	3	3
130	9	9	8	8	7	6	6	4	5	4	4	4	4	4	4	4	4	4	4
127	11	12	10	10	8	7	6	5	5	5	5	5	5	5	5	5	5	4	5
123	14	15	13	12	10	8	7	6	6	6	5	5	5	5	5	6	5	5	5
120	17	18	16	14	12	9	8	7	7	6	6	6	6	6	6	6	6	6	6
117	19	21	19	17	14	10	9	8	7	7	7	6	6	6	6	6	6	6	6
113	21	23	21	19	15	11	9	9	7	7	7	7	7	7	7	6	6	6	7
110	21	23	21	20	16	11	9	8	7	7	6	6	6	6	6	6	6	6	6
107	20	22	21	20	15	11	8	8	6	6	6	6	6	6	6	6	5	5	6
103	17	19	19	19	14	10	7	6	5	5	5	5	5	5	5	5	4	4	4
100	13	15	15	16	12	8	5	5	4	4	3	3	3	3	3	3	3	3	3
160	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2
147	1	1	1	0	1	1	1	0	1	0	0	0	0	1	0	0	0	0	2
143	2	2	2	2	2	1	1	2	2	2	1	1	2	1	2	2	2	2	2
140	3	3	3	2	3	2	2	3	3	2	3	2	3	4	4	4	4	4	2
137	3	3	3	3	3	2	3	3	3	4	2	3	3	4	4	4	4	3	3
133	3	3	3	3	3	3	3	3	4	3	5	3	8	8	5	8	7	7	7
130	4	4	4	4	3	4	4	4	4	4	5	6	10	9	12	11	9	9	9
127	5	5	4	4	4	4	4	4	4	5	6	8	10	10	14	13	10	10	10
123	5	5	5	5	5	5	5	5	5	6	7	9	11	13	17	16	10	10	10
120	6	6	6	5	5	6	6	6	6	7	8	10	14	17	21	19	11	11	11
117	6	6	6	6	6	6	6	7	7	8	10	12	16	20	24	21	11	11	11
113	7	6	6	6	6	6	7	7	8	9	11	13	19	24	26	22	11	11	11
110	6	6	6	6	6	6	7	8	8	9	11	14	20	26	26	21	10	10	10
107	6	5	5	5	6	6	6	7	7	9	11	14	20	27	25	19	8	8	8
103	4	4	4	4	4	5	5	6	6	7	10	13	19	26	22	16	7	7	7
100	3	3	3	3	4	4	4	5	5	6	8	11	16	23	18	12	5	5	5

Table 8. Nitric oxide density for the 1985-1986 equinox periods as a function of geomagnetic latitude and altitude for days when  $A_p < 5$ . Observations for the periods March 7 to April 2 of 1985 and 1986 and September 10 to October 6, 1985, are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

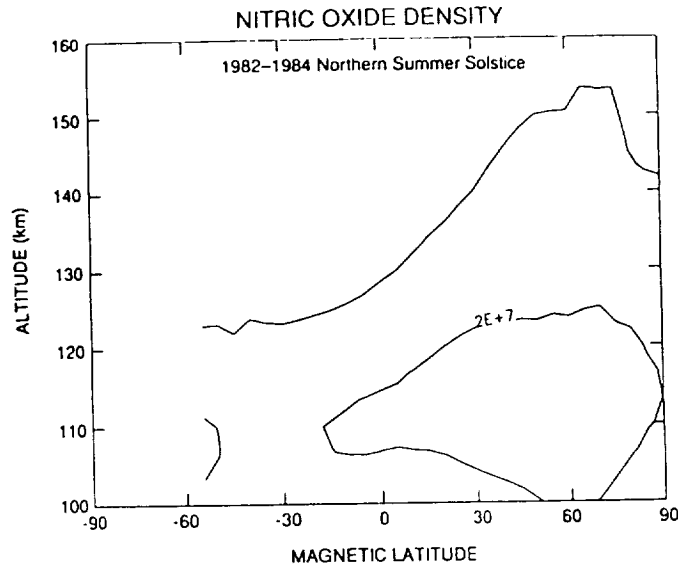


Figure 9. Nitric oxide density for the 1982-1984 northern summer solstice as a function of geomagnetic latitude and altitude. Observations for the periods June 8 to July 4 for the years 1982, 1983, and 1984 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

**Table 9. NO Density ( $\times 10^4$  molecules/ $\text{cm}^3$ )**

*Geomagnetic Latitude*

Alt	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160							0	0	0	1	1	1	1	1	1	1	1	1	1
157							0	0	1	1	1	1	1	1	1	1	1	1	1
153							0	2	2	1	1	1	1	1	1	1	1	2	2
150							1	2	2	1	1	1	1	1	1	1	2	3	4
147							1	1	2	1	1	1	2	3	3	4	4	5	5
143							1	1	2	1	2	3	3	3	4	4	4	5	6
140							1	1	3	3	3	3	3	4	4	5	5	6	6
137							2	2	3	3	3	3	3	4	4	5	5	6	7
133							3	3	4	4	4	4	4	5	5	5	6	7	7
130							1	5	5	5	5	6	5	5	6	6	7	7	8
127							2	7	7	7	8	7	7	8	8	9	9	10	11
123							3	10	10	9	10	10	10	10	11	11	12	13	14
120							5	13	13	12	13	13	13	13	14	14	15	16	16
117							7	16	16	16	16	16	16	16	16	17	18	18	19
113							8	19	18	16	18	18	18	18	18	19	19	20	21
110							10	21	20	17	19	19	19	19	20	20	21	22	21
107							10	21	20	17	19	19	19	19	20	20	20	20	20
103							10	20	19	15	17	18	17	18	18	18	18	18	17
100							10	18	16	13	14	15	14	15	15	15	15	14	14
160	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
157	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
153	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	6	3	3	3
150	4	5	6	6	6	7	7	9	9	9	10	10	11	11	11	11	9	9	8
147	5	6	6	7	7	8	8	9	10	11	11	12	12	12	12	11	10	9	9
143	5	6	7	7	8	8	9	10	11	12	12	13	13	13	13	11	10	10	10
140	6	6	7	8	9	9	10	11	12	13	13	14	14	14	14	12	11	11	11
137	6	7	8	9	10	11	11	12	13	14	14	14	15	15	14	12	11	11	11
133	7	8	9	10	11	12	13	14	14	15	15	15	15	16	15	13	13	12	12
130	9	10	11	12	13	14	15	15	16	16	16	17	17	17	17	15	14	14	13
127	11	12	13	14	15	16	17	17	18	18	18	18	18	18	19	17	17	16	15
123	14	15	16	17	18	19	19	20	20	20	20	20	20	21	21	21	20	18	17
120	16	17	18	19	20	21	22	22	22	22	22	23	23	24	24	22	21	20	18
117	19	19	20	21	22	23	24	24	24	24	24	25	25	26	27	25	23	21	20
113	21	21	21	22	23	24	25	25	25	25	26	27	28	29	29	28	26	24	21
110	21	21	21	22	23	24	24	24	24	25	26	27	27	29	30	29	25	23	20
107	20	20	20	20	20	21	22	23	24	24	26	27	28	29	27	23	21	18	18
103	17	17	17	17	17	18	19	20	21	22	23	25	26	26	24	20	17	15	15
100	14	14	13	13	13	14	15	16	17	18	20	21	22	22	19	15	13	12	11

Table 9. Nitric oxide density for the 1982-1984 northern summer solstice as a function of geomagnetic latitude and altitude. Observations for the periods June 8 to July 4 for the years 1982, 1983, and 1984 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

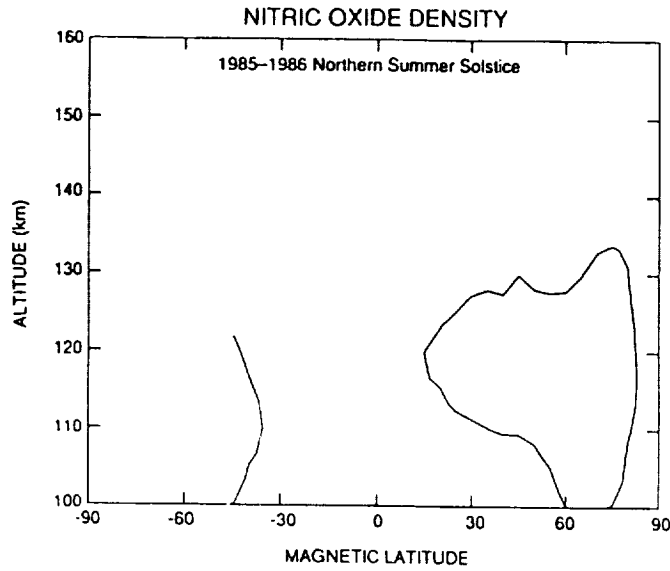


Figure 10. Nitric oxide density for the 1985-1986 northern summer solstice as a function of geomagnetic latitude and altitude. Observations for the periods June 8 to July 4 for the years 1985 and 1986 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 10. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )

Alt	Geomagnetic Latitude																		
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	2	1	2	2	0	1				
150	0	0	0	0	0	0	0	0	0	2	2	2	2	3	3				
147	0	0	1	1	1	2	2	2	2	3	3	3	3	3					
143	0	2	1	1	2	2	2	2	2	3	3	3	3	3					
140	3	2	2	1	2	2	2	2	2	3	3	3	3	4					
137	4	3	3	2	2	3	3	3	3	3	3	3	3	4					
133	6	4	3	2	3	3	3	3	3	3	3	3	4	4					
130	5	4	4	4	3	3	4	4	4	4	4	4	4	5					
127	5	7	5	5	4	4	4	4	4	5	5	5	5	6					
123	5	9	7	6	5	5	5	5	5	5	6	6	6	7					
120	7	11	8	7	6	6	6	6	6	6	6	6	7	8					
117	8	13	10	9	8	7	7	7	7	7	7	7	7	8					
113	8	15	11	9	8	7	7	7	7	7	7	7	7	8					
110	9	15	11	10	9	8	7	7	7	7	7	7	7	8					
107	8	15	11	9	8	7	7	7	7	7	7	7	7	7					
103	8	13	9	8	7	6	6	6	6	6	6	6	6	6					
100	7	10	7	6	6	5	5	5	5	4	5	4	4	4					
160	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
153	1	2	0	0	0	0	0	0	0	0	0	3	4	3	3	0	4	0	0
150	3	3	5	5	6	0	2	0	2	2	3	4	7	7	6	6	4	0	0
147	3	4	5	6	7	7	6	7	7	7	7	7	7	7	6	7	4	4	3
143	3	4	5	6	7	7	7	7	7	7	8	8	8	7	7	7	4	4	3
140	4	4	5	6	7	8	8	8	8	8	8	8	8	8	7	7	4	4	3
137	4	5	6	7	7	7	7	7	7	8	8	8	8	8	7	7	4	4	3
133	5	5	6	7	7	7	7	7	7	8	8	8	8	8	7	7	4	4	3
130	5	6	7	7	8	8	8	8	8	8	8	8	8	8	8	7	7	4	3
127	6	7	7	8	8	9	9	9	9	9	9	9	9	9	9	8	7	7	6
123	7	8	8	9	9	10	10	10	10	10	10	10	10	10	10	10	9	8	7
120	8	8	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	9	8
117	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	8
113	9	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	9	8
110	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9	9	8	7	6
107	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	7	6	5
103	6	6	5	5	5	6	6	6	6	6	6	6	6	6	6	6	5	4	3
100	4	4	4	3	4	4	4	5	5	5	5	5	5	5	4	4	3	3	3

Table 10. Nitric oxide density for the 1985-1986 northern summer solstice as a function of geomagnetic latitude and altitude. Observations for the periods June 8 to July 4 for the years 1985 and 1986 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

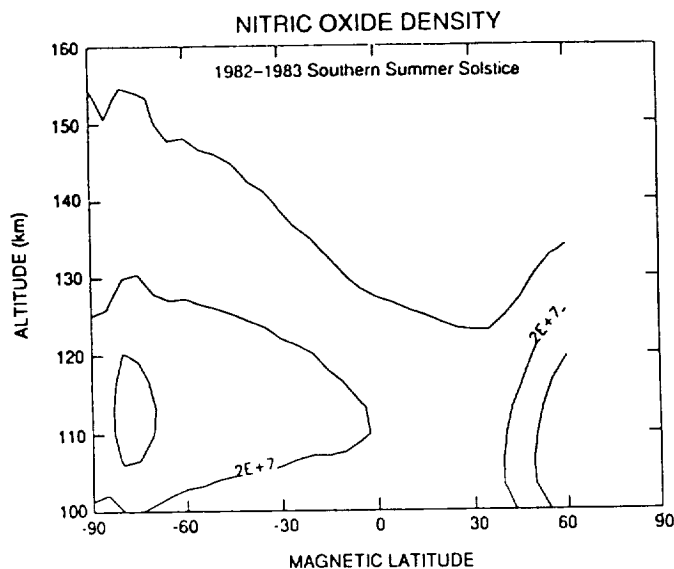


Figure 11. Nitric oxide density for the 1982-1983 southern summer solstice as a function of geomagnetic latitude and altitude. Observations for the period December 9 to January 4 for 1982 and 1983 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 11. NO Density ( $\times 10^4$  molecules/ $\text{cm}^3$ )

Alt	Geomagnetic Latitude																				
	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0		
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
157	5	5	5	6	4	3	2	0	0	0	0	2	0	0	2	0	2	0	2	1	1
153	13	5	13	11	10	6	6	3	2	2	2	3	0	3	2	2	2	2	2	1	
150	11	11	12	12	10	9	9	9	8	8	7	7	6	3	3	2	2	2	2	2	
147	12	12	12	13	11	11	11	10	10	9	9	9	8	7	8	7	6	5	4	5	
143	13	12	13	14	12	12	12	12	11	11	10	9	9	8	8	8	6	5	5	5	
140	13	13	14	15	13	13	13	13	12	12	11	10	10	9	8	8	7	6	5	5	
137	14	14	15	16	15	14	15	14	14	13	12	12	11	10	9	8	7	6	6	6	
133	16	16	17	18	16	16	16	16	15	15	14	13	12	11	11	10	9	7	7	7	
130	17	17	20	20	18	18	18	18	17	17	16	15	14	14	13	11	10	9	8	8	
127	19	19	23	23	21	20	20	20	20	19	18	18	16	16	15	14	12	11	10	10	
123	21	22	27	26	24	23	23	22	22	21	21	20	19	19	18	16	15	14	13	13	
120	23	24	30	29	27	25	25	24	24	24	23	22	21	21	20	19	18	16	16	16	
117	25	26	33	32	29	27	27	26	25	25	24	24	23	23	22	21	20	19	18	18	
113	27	27	34	33	30	28	27	26	26	26	25	24	24	23	22	22	21	20	19	19	
110	27	27	34	33	30	28	27	26	25	25	24	23	23	22	22	21	21	20	19	18	
107	25	25	31	30	28	26	24	24	23	22	22	21	21	20	20	20	20	20	19	18	
103	22	22	26	26	24	22	21	20	19	19	18	17	17	16	16	17	17	16	16	16	
100	18	17	20	20	19	17	16	16	15	14	14	13	13	12	12	13	13	13	13	12	
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	90	
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
157	1	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
153	1	1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
150	2	1	2	2	2	2	1	1	1	2	4	2	4								
147	4	4	4	4	4	4	3	3	3	3	4	4	8								
143	5	4	4	4	4	4	3	3	3	4	4	5	7								
140	5	5	4	4	4	4	4	3	4	4	5	6	9								
137	6	5	5	5	4	4	4	4	4	5	6	7	8								
133	7	6	6	5	5	5	5	5	5	6	8	9	10								
130	8	8	7	7	6	6	6	6	7	8	10	13	13								
127	10	10	9	9	8	8	8	8	9	10	14	17	18								
123	13	13	12	11	11	10	10	10	11	13	17	22	24								
120	16	15	14	14	13	12	12	12	14	16	21	26	30								
117	18	17	17	16	15	15	14	14	16	19	24	30	34								
113	19	19	18	18	17	16	16	16	18	22	28	34	38								
110	20	19	18	18	17	16	16	17	20	25	30	36	39								
107	18	18	17	16	16	16	15	17	21	26	31	36	38								
103	16	15	15	14	14	13	14	16	21	26	30	35	36								
100	12	11	11	11	11	10	11	13	16	22	25	31	31								

Table 11. Nitric oxide density for the 1982-1983 southern summer solstice as a function of geomagnetic latitude and altitude. Observations for the period December 9 to January 4 for 1982 and 1983 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .

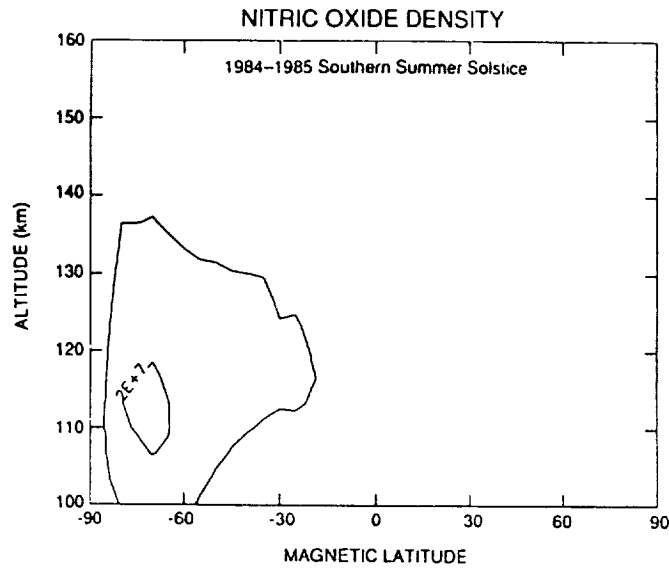


Figure 12. Nitric oxide density for the 1984-1985 northern summer solstice as a function of geomagnetic latitude and altitude. Observations for the periods December 9 to January 4 for the years 1984 and 1985 are averaged together. The contour interval is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$  and the lowest contour level is  $1 \times 10^7$  molecules  $\text{cm}^{-3}$ .

Table 12. NO Density ( $\times 10^6$  molecules/ $\text{cm}^3$ )  
Geomagnetic Latitude

Alt	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	5	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	4	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	8	7	7	8	4	5	4	4	2	0	2	0	1	0	0	0
147	0	0	6	9	8	8	8	6	5	7	4	4	2	1	2	2	1	1	0
143	5	6	4	9	8	8	8	6	5	7	4	4	4	2	4	3	3	3	0
140	5	6	9	10	9	8	7	7	8	7	6	6	5	5	4	4	3	3	2
137	4	5	10	10	10	10	9	8	9	8	8	7	6	5	5	4	4	3	3
133	5	6	11	12	11	11	10	9	9	9	8	8	7	6	7	6	5	4	4
130	5	6	12	13	13	12	11	11	11	10	10	10	9	8	7	7	6	5	4
127	6	7	14	15	15	14	12	12	11	11	11	11	10	9	8	7	7	6	5
123	7	8	16	17	17	15	13	13	12	12	11	11	10	9	8	8	7	6	6
120	7	9	18	19	19	17	15	14	13	12	12	11	11	11	10	9	9	8	7
117	8	10	19	21	21	19	16	15	13	13	12	11	11	10	9	9	8	7	7
113	9	10	20	21	22	20	17	15	13	12	11	11	10	10	9	9	8	7	7
110	9	10	19	20	22	20	17	15	13	11	10	10	9	9	9	8	7	7	6
107	9	10	17	18	20	19	17	13	11	10	9	8	8	7	7	7	6	5	5
103	8	8	14	15	17	17	15	12	9	8	7	6	6	5	6	6	5	5	5
100	6	7	10	11	13	14	12	9	7	5	5	4	4	3	4	4	3	3	3
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
160	0	0	0	0	0	0	0	0	0										
157	0	0	0	0	0	0	0	0	0										
153	0	0	0	0	0	0	0	0	0										
150	0	0	0	0	0	0	0	0	0										
147	0	2	0	0	0	0	0	0	0										
143	2	3	1	0	0	0	0	0	0										
140	3	3	3	1	0	1	0	0	0										
137	4	3	3	3	2	1	1	3	0										
133	4	4	3	3	2	2	3	2	2										
130	5	4	4	3	3	2	2	2	2										
127	6	5	5	4	3	3	3	2	2										
123	6	6	5	5	4	3	4	2	2										
120	7	6	6	5	5	4	5	3	2										
117	7	7	6	6	5	5	5	3	2										
113	7	7	7	6	6	5	5	4	3										
110	7	7	6	6	6	5	6	4	5										
107	6	6	6	5	5	5	6	5	7										
103	5	5	5	4	4	5	5	6	10										
100	3	3	3	3	3	4	4	5	8										

Table 12. Nitric oxide density for the 1984-1985 southern summer solstice as a function of geomagnetic latitude and altitude. Observations for the periods December 9 to January 4 for the years 1984 and 1985 are averaged together. The averaged densities are given in units of  $10^6$  molecules  $\text{cm}^{-3}$ .