

Features of the Arctic Stratosphere during IPY

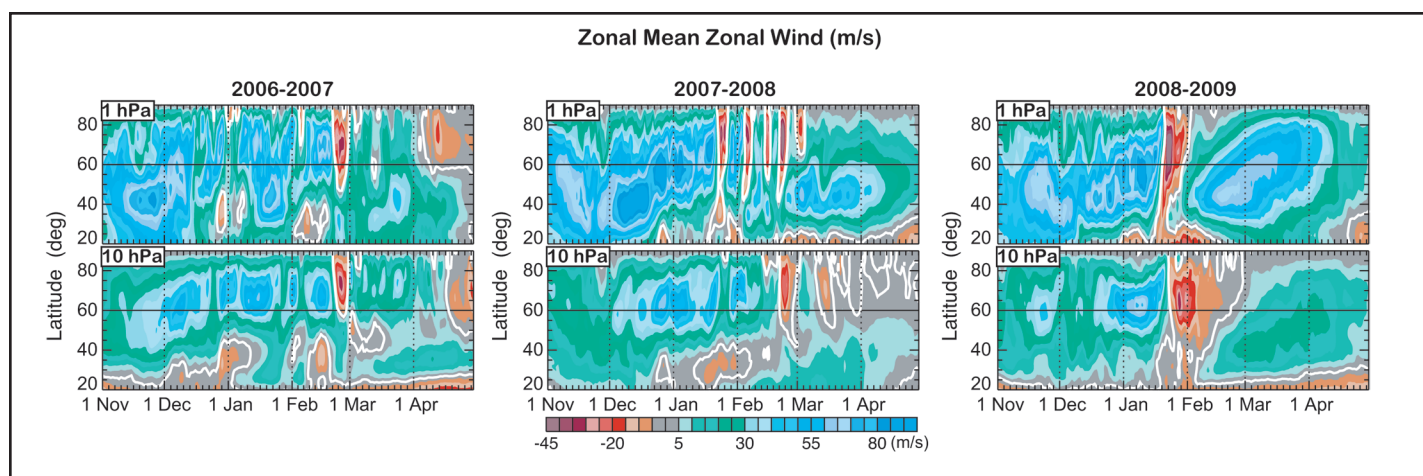


Figure 1

GEOS-5 1 hPa (top) and 10hPa (bottom) zonal-mean zonal winds during (left to right) the 2006—2007, 2007—2008, and 2008—2009 Arctic winters. The black line is at 60°N latitude.

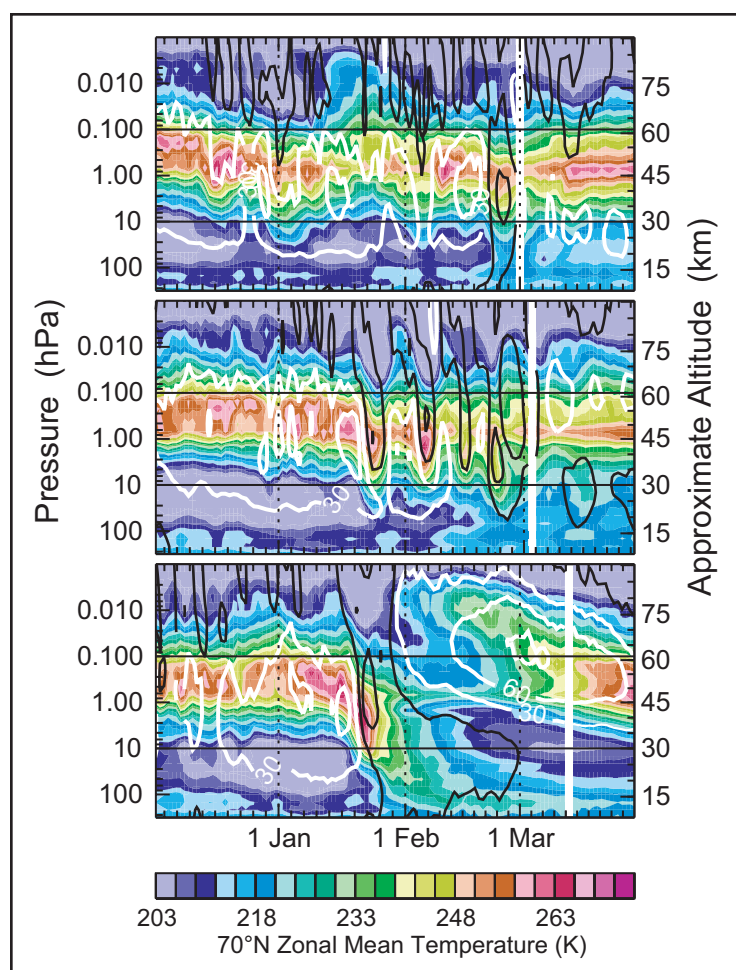
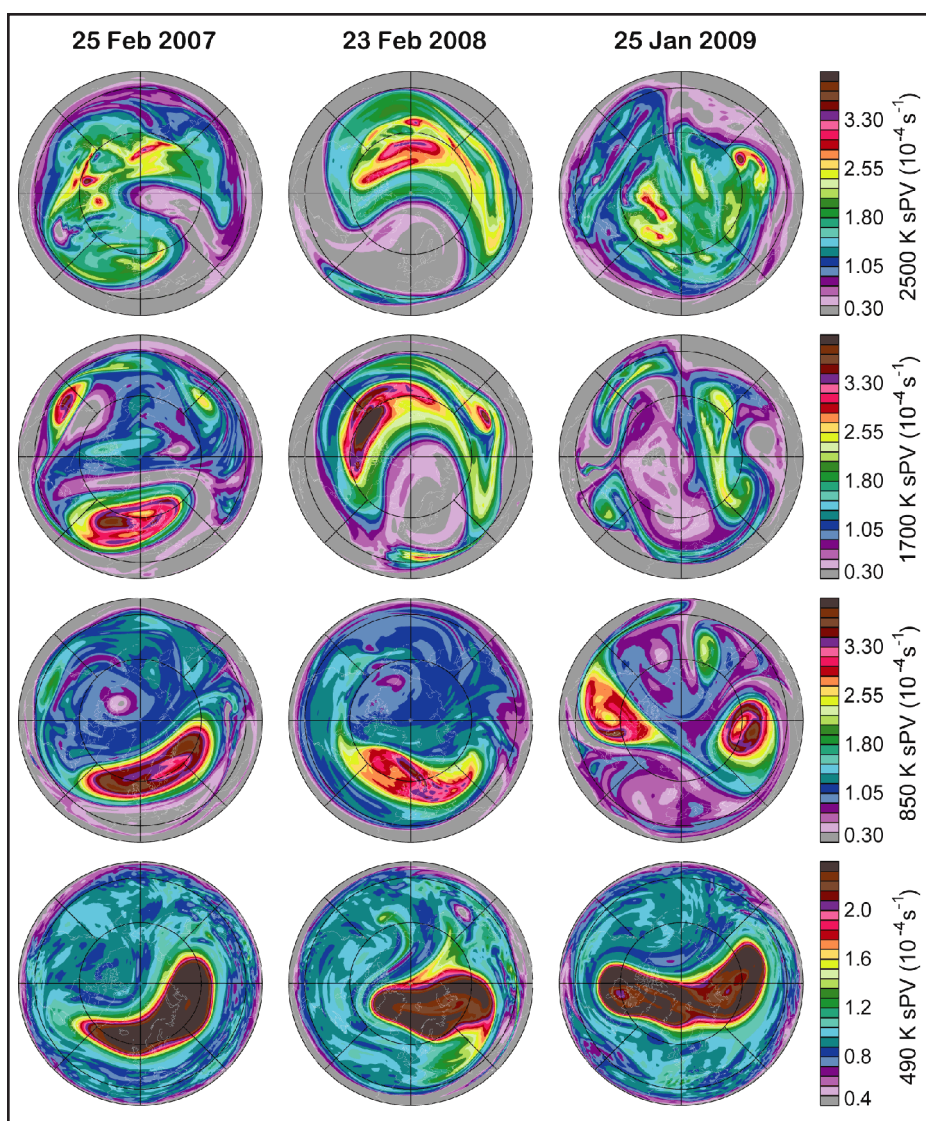


Figure 2

MLS zonal mean 70°N zonal-mean temperatures in (top to bottom) 2006-2007, 2007-2008, and 2008-2009. Overlaid contours are zonal mean winds of -30, 0, 30 and 60 m/s, with negative (easterly) and zero values in black, positive (westerly) values in white.

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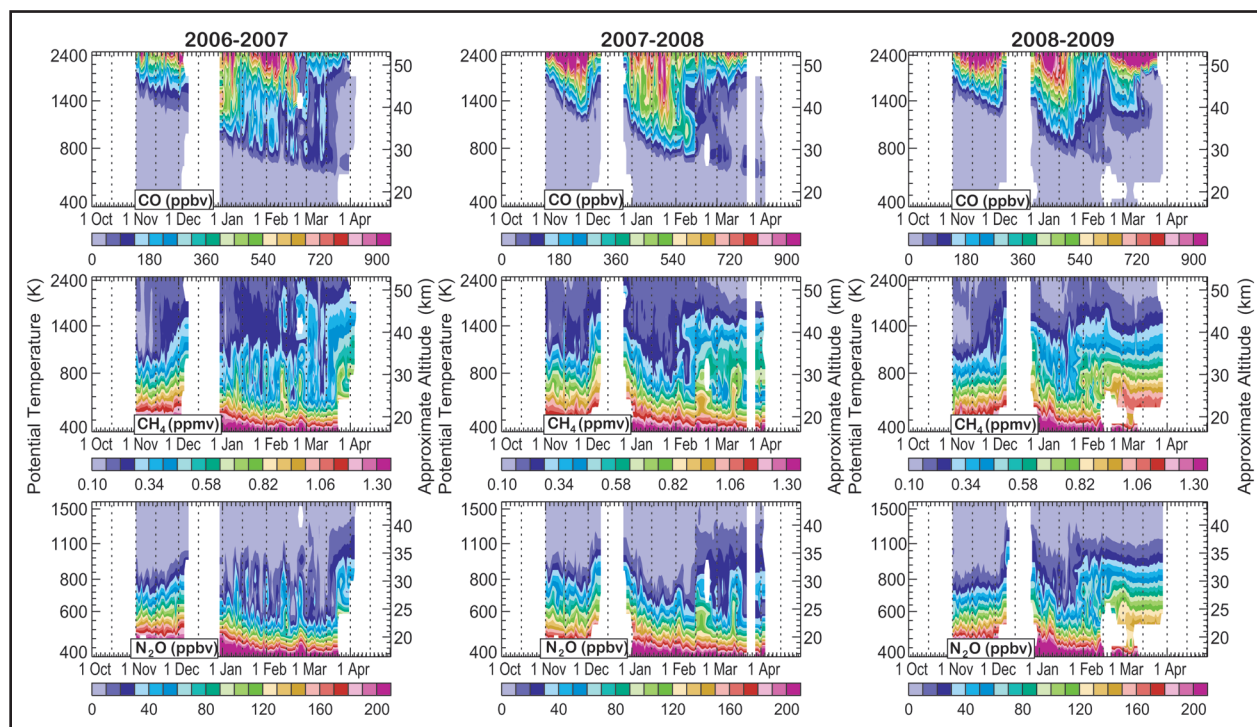


< **Figure 3**

Maps of GEOS-5 scaled potential vorticity (sPV) (e.g. Manney et al., 1994) in the lower (490K), middle (850K), upper stratosphere (1700K), and in the lower mesosphere (2500K), on a date in each year 2007 through 2009 that was at the beginning of the major SSW in that year.

v **Figure 4**

Vortex averages (calculated as described by Manney et al., 2007) of long-lived trace gas measurements from ACE-FTS during the IPY winters. Top to bottom: CO, CH₄, and N₂O. CO and CH₄ are shown from 400 to 2500K (through the typical stratopause level); N₂O is shown from 400 to ~1600 K, into the upper stratosphere.



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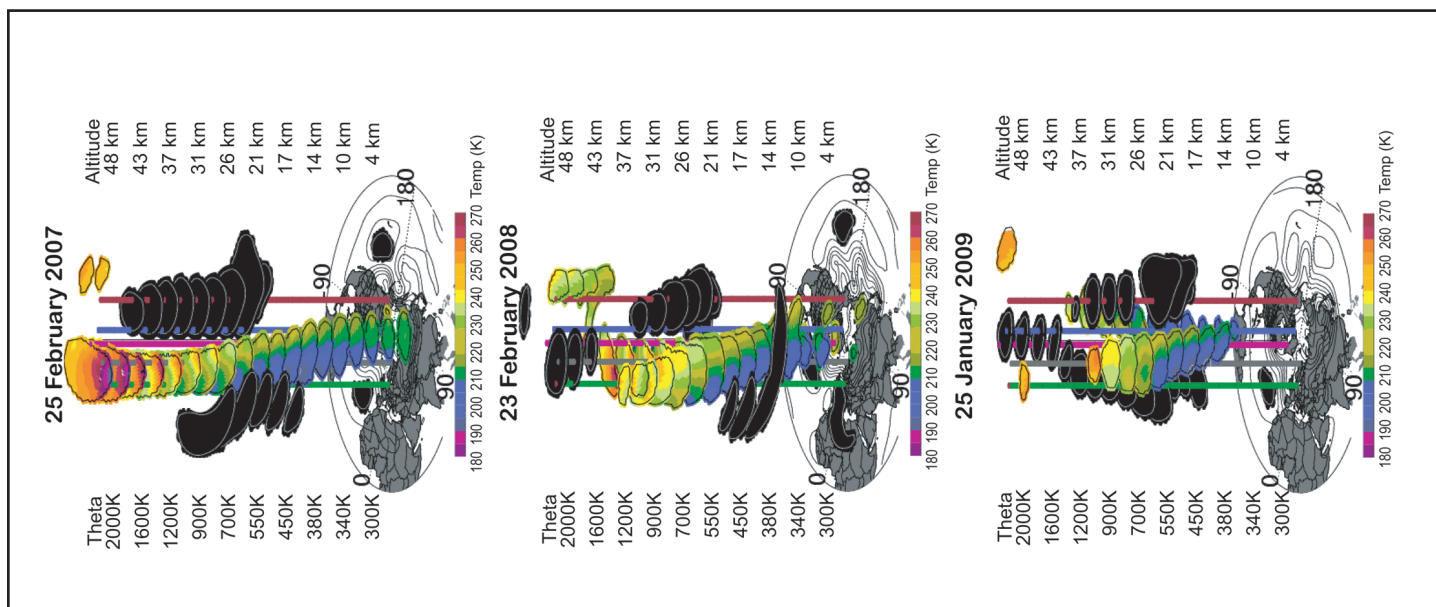


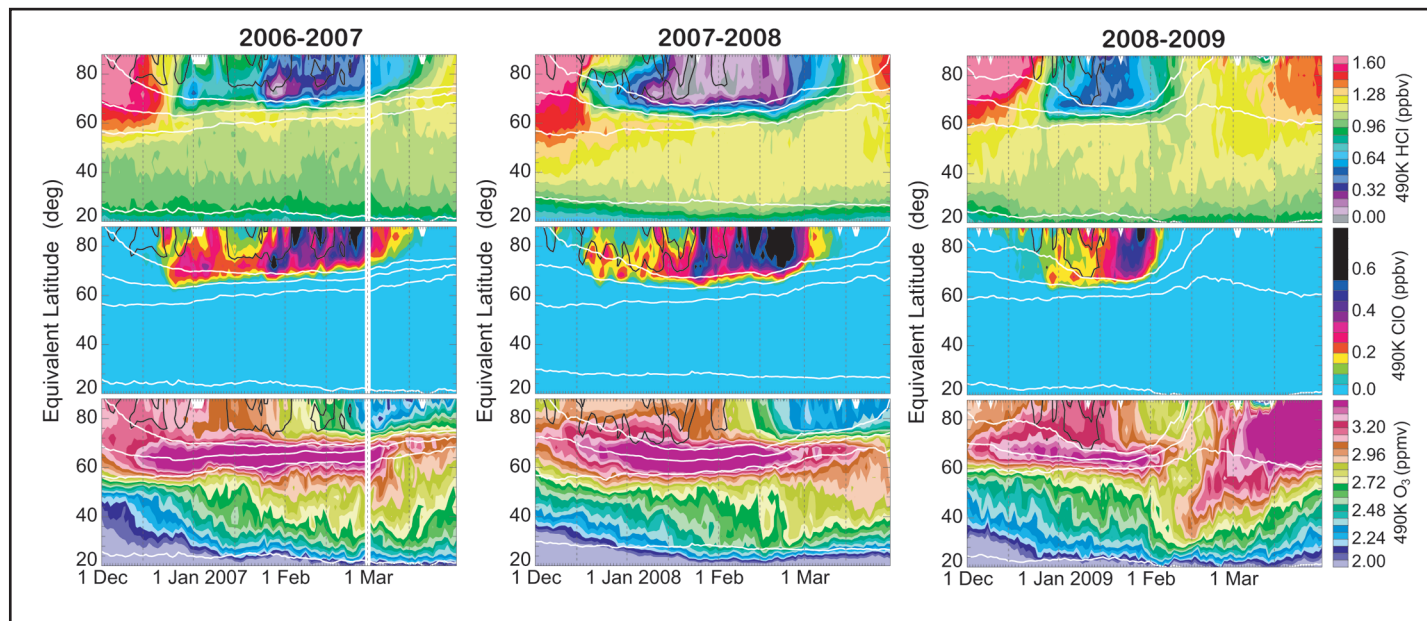
Figure 5

Three-dimensional representation of the Arctic vortex (coloured with temperature) and anticyclones (black) (Harvey et al., 2002) on a date in each year 2007 through 2009 that was at the beginning of the major SSW in that year.

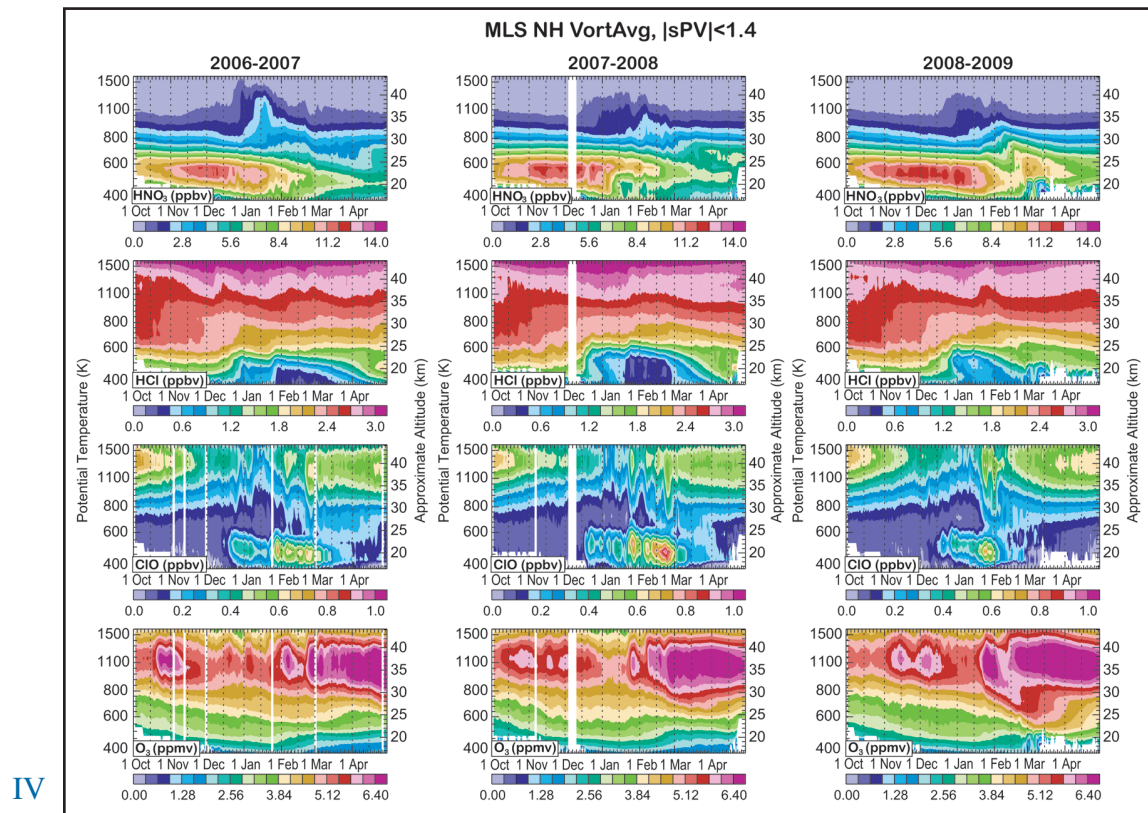
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Figure 10

EqL-time series of MLS (top to bottom) HCl, ClO and O₃ in the (left to right) 2006-2007, 2007-2008, and 2008-2009 Arctic winters. Only data from the day (ascending) side of the orbit are shown for ClO. Overlays are PV contours in the vortex edge region.



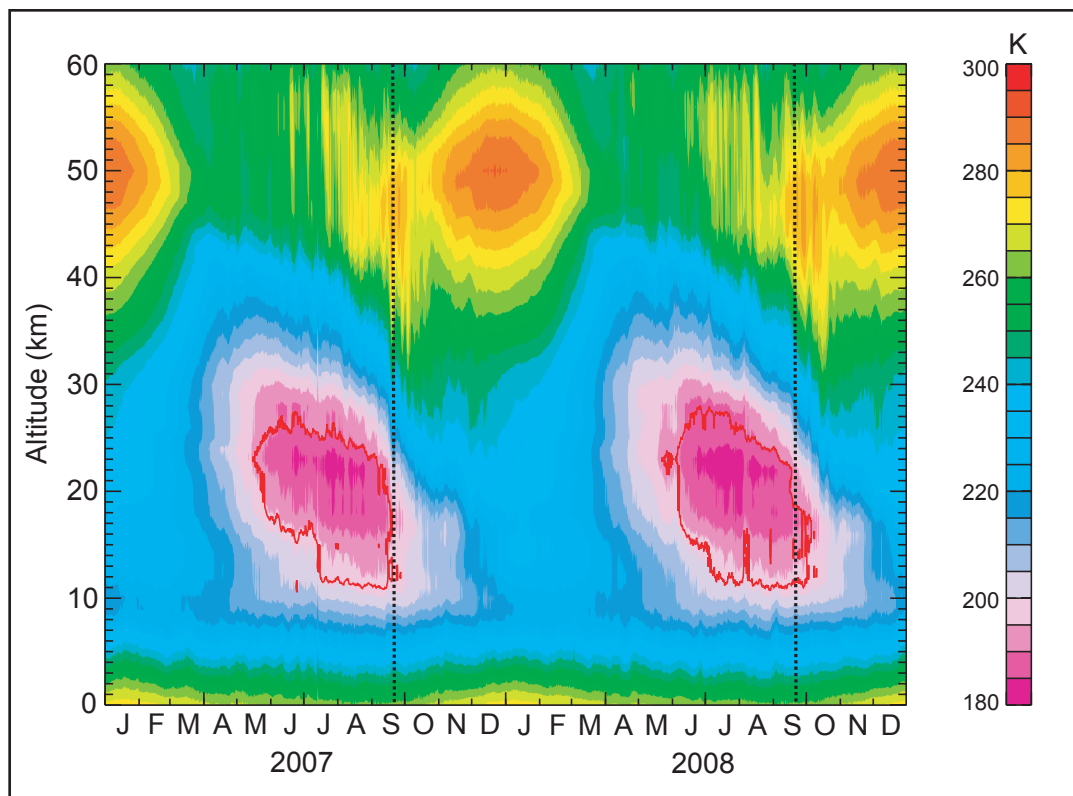
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< **Figure 11**

Vortex-averaged (within a scaled PV contour, e.g. Manney et al., 2007) MLS (top to bottom) HNO₃, HCl, ClO and O₃ during the (left to right) 2006-2007, 2007-2008, and 2008-2009 Arctic winters.

Studies of the Antarctic Stratosphere During IPY



< **Figure 1**

Zonal mean temperature for the latitude range 85°S to 65°S as a function of time and altitude derived from Aura MLS version 2.2 retrievals. The individual profiles were converted to a uniform grid in geopotential height through linear interpolation before creating the daily zonal averages. Bias corrections have not been applied to individual measurements. The red contour delineates the NAT frost point evaluated using observed MLS temperature and mixing ratios of HNO₃ and H₂O. The dashed vertical lines mark the time of the austral spring equinox.