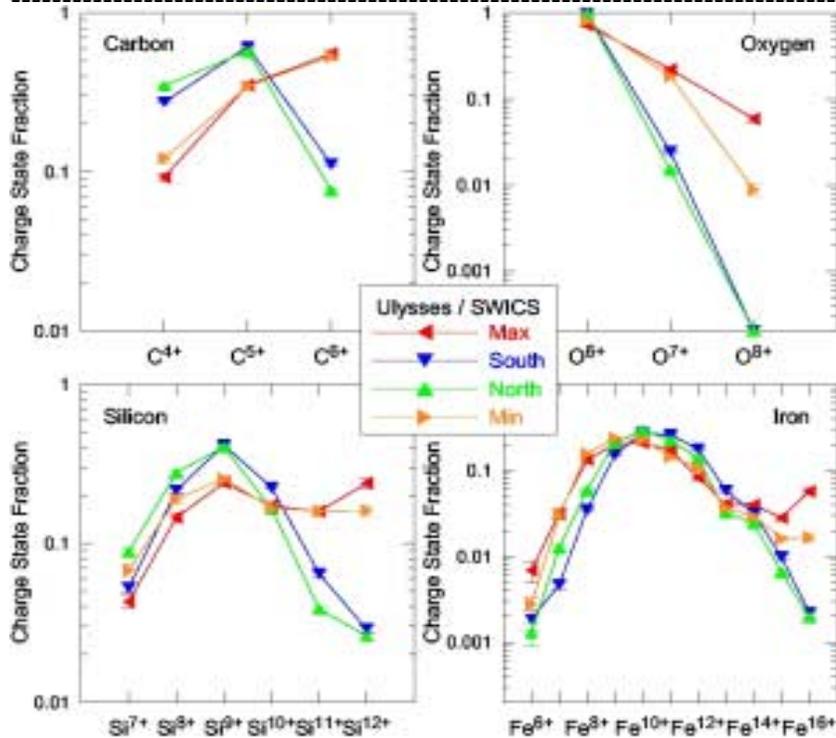
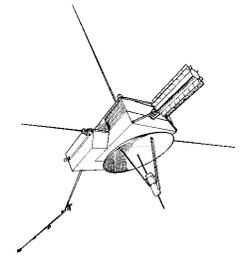




Composition and Charge State of the Solar Wind



Charge states distributions of solar wind ions are shown for the slow wind (Max and Min) and the fast wind (North and South). Si and Fe have about the same temperature for fast and slow with enhancements at high charge states for the slow wind. The O and C distributions require a cooler source for the fast wind than the slow wind.

Observations using the Ulysses/SWICS ion composition spectrometer have determined the average solar wind charge state and elemental abundances of over 40 ion species of He, C, N, O, Ne, Mg, Si, S, and Fe. In the fast solar wind (South and North data in Figure) the charge states are consistent with a single coronal freezing-in temperature for each element, whereas in the slow wind (Min and Max data) the distributions require contributions from a range of temperatures. The low first ionization potential (FIP) elements (Mg, Si, Fe) are enhanced relative to the photosphere in the slow wind by not quite a factor of 3. In the fast wind low FIP elements are less enhanced but are still above photospheric values. These results require that FIP fractionation models produce a stronger and more variable enhancement in the slow wind, and a weaker (perhaps of different origin) enhancement in the fast wind.