

## 3.1.1.2.2 Composition variations

- Study and explain composition variations: wide variations including Fe/O ratios that vary by a factor of 100 (Mewaldt et al., 2006).

The intensity and composition of suprathermal ions with 10 to 100 keV/nuc is known to be much more variable than the solar wind. One reason for this variability is that suprathermal particles are believed to arise from a variety of sources, including previous gradual and impulsive SEP events, ubiquitous micro- and nano-flaring at the Sun, and interplanetary acceleration of solar wind by stochastic processes (Fisk and Gloeckler 2006).

In a steady state solution, particles are assumed to be continually injected at the shock and a power law spectrum is achieved when there is enough time. However, at a propagating CME-driven shock, the amount of time available for acceleration is limited. Thus, for the acceleration to successfully operate, it is crucial that there are enough seed particles.

We need observations of the suprathermals and SEPs **before and during CMEs**, to know what material is actually accelerated. Simultaneous observations of the near Sun seed particles with SPP would be very helpful.