



Solar Periodicity Observed by Voyager 1 in Distant Anomalous Cosmic Rays

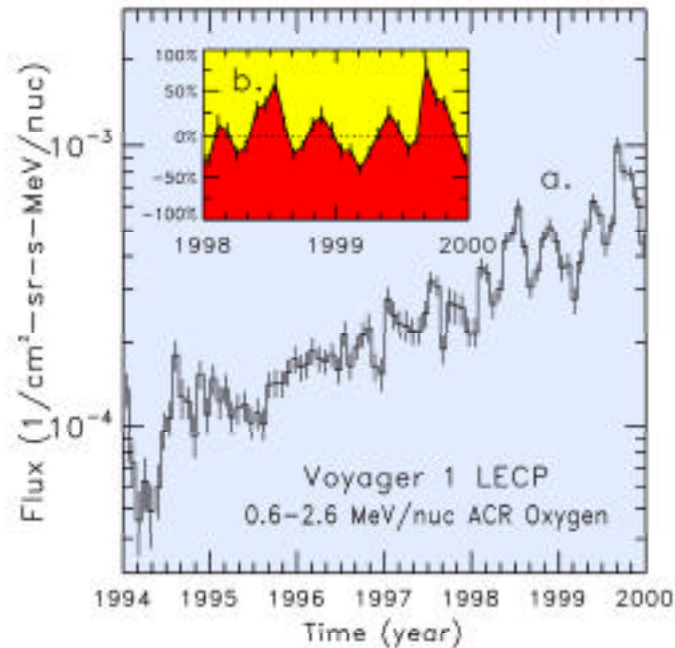


Figure. The intensity (a) of roughly 1 MeV/nuc anomalous cosmic ray oxygen at Voyager 1 has quasi-periodic variations during 1997-1999. The periodicity is most prominent during 1998 and 1999, shown here (b) with the trend removed. Harmonic analysis, indicates the period to be 151 days, with greater than 5σ statistical significance.

- Roughly 154-day periodicities are known to exist in solar flares, sunspots and the interplanetary magnetic field near the Earth
- The physics of these well-documented periodicities is not yet understood
- The Voyager 1 LECP (Low Energy Charged Particle) instrument has now detected this periodicity in cosmic ray fluxes in the outer reaches of the heliosphere (69 - 76 AU)
- Anomalous cosmic ray (ACR) H, He and O at Voyager 1 all show approximately 150-day periodicities that are in phase with one another during 1998 and 1999
- The 150-day ACR periodicity may be due to periodic magnetic field variations traveling past the Voyager 1 spacecraft and scattering ACRs