

# The acceleration of low energy electrons in 29 October 2003 IPS event.

# Kouta Nakata[1]; Toshio Terasawa[2]; Yoshifumi Saito[3]; Toshifumi Mukai[3]

[1] Earth and Planetary Sci, Tokyo Univ; [2] Dept. Earth Planetary Sci., Univ. of Tokyo; [3] ISAS

We here analyze the interplanetary shock (IPS) event observed by GEOTAIL satellite on 29 October 2003, which was accompanied with the coronal mass ejection (CME) hurled by one of the solar flares that successively erupted from late October to early November 2003.

This October-November series of flares contains several very strong, energetic ones, and the parental flare of this 29 October event marked X17 class at the GOES X-ray flux. For low energy electrons below 38.2 keV, however, contrary to our expectation that strong flare might lead to strong particle acceleration, the acceleration was not so strong even when compared with the events we have analyzed previously, though much greater was the magnitude of its parental flare, its speed, or the storm it caused.

This suggests that the factors other than the flare scale or shock speed may also be important, and necessarily, we should focus on whistler wave properties as well as several other properties, because whistlers are considered to be essential to the acceleration of low energy electrons when the DSA theory, one of the most accepted mechanisms that explain the particle acceleration around the collisionless shocks, is granted. Of course, other properties as the shock angle or Alfvén Mach number are no less important, since, for example, the effect of shock angle on the particle acceleration and wave properties around the earth's bowshock has been studied well.

In our previous work, we have mainly studied polarization in the frequency range of 0.01-8.0Hz, the lower part of whistler waves whose frequency range is about 1-100Hz at 1 AU. Here with this 29 October 2003 event, data accumulation additionally enables us to compare the spectra, though not sufficient yet, for 4 events up to 64Hz covering most part of the frequency range of whistlers.

In this presentation, we analyze 29 October 2003 event by utilizing GEOTAIL data, comparing with the result of other events in terms of wave properties, shock angle, Mach number, and so on, to discuss what triggers the strong acceleration of non-relativistic electrons as have been observed in several solar IPS events.