

MONITORING HIGH-SPEED PARTICLE STREAM FROM EQUATORIAL CORONAL HOLE

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Abstract

Coronal hole is a part of solar corona that visually appears as a black or dark region in EUV or X-ray images of the Sun. This indicates that its density is very low compared to other such as active regions. The nature of low density can be understood as coronal hole has an opened-magnetic field structure which allows coronal particles escape easily to interplanetary space. Eventually, a coronal hole may appear at the equator region of the Sun. The particle stream from this coronal hole will sweep the Earth when it is located at appropriate position and may cause a disturbance to the Earth's magnetic fields. Monitoring the particle stream from coronal hole is therefore very important to space weather. We utilized data from Extreme-ultraviolet Imaging Telescope (EIT) of Solar and Heliospheric Observatory (SOHO) to trace the position of equatorial coronal hole and data from SWEPAM instrument aboard ACE (Advanced Composition Explorer) spacecraft to monitor the solar wind parameters at L-1 point. It is shown that by monitoring the position of equatorial coronal hole at the Sun, it is possible to predict the occurrence of a high-speed particle stream that may disturb the Earth's space environment several days in advance.

Key words: *the Sun, coronal hole, solar win, high-speed particle stream.space weather*

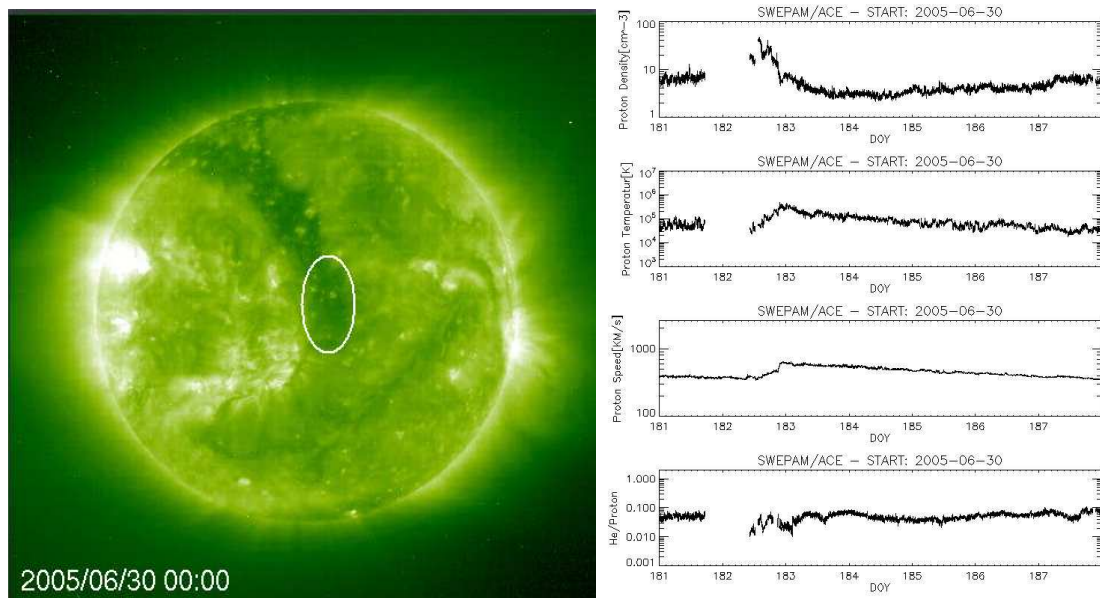


Figure 1. An equatorial coronal hole connected to the North's pole was appeared at the center of the Sun in June 30, 2005, as a dark region (left). The coronal hole caused a high-speed particle stream 2 days later (right).