

PEM029-P12

Room: Convention Hall

Time: May 26 17:15-18:45

Temperature structures of polar corona in the Sun as a source region of Solar winds

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Solar coronal holes are essentially occupied with open magnetic fields extending to the inter-planetary space, and they are thought to be source regions of high-speed solar winds. The heating mechanism of coronal holes as well as the acceleration mechanism of solar winds is still an open question. Here, we investigated coronal temperature structures above a polar coronal hole with the instruments aboard the Hinode satellite, and discussed where the thermal energy is deposited in the polar corona.

The Hinode satellite has two instruments to observe the solar corona. One is EUV Imaging Spectrometer (EIS), which can derive the multi-thermal property of coronal plasma in a small field-of-view. The other is X-ray Telescope (XRT), which can derive the spatial structure of a "mean" temperature of coronal plasma in a wide field-of-view. With the coordinated observation with EIS and XRT, we found that the polar corona probably consists of many fibril (open) fields that are heated near their footpoints individually.

Keywords: Hinode satellite, solar coronal holes, solar winds