

Formation of a plasmaspheric shoulder derived from global images

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The Extreme Ultraviolet Imager (EUV) on the IMAGE satellite provides the global images of the He⁺ distribution in the plasmasphere by detecting resonantly scattered solar 30.4-nm radiation. In some features clearly observed by the EUV instrument, one of most interesting structures is a 'shoulder'. A shoulder, which is characterized by a sharp azimuthal gradient in He⁺ density toward earlier local time, forms in the morning sector and corotates with the Earth for many hours. The EUV instrument observed these shoulder features several times, but what usually forms a shoulder is an issue still under debate. We identified the shoulder events from 3-year database of EUV images by visual inspection, and investigated each event with the variations of solar wind and IMF. Our study will provide important clues to understand the formation of a shoulder and the plasmasphere dynamics.