

かぐやで観測された月周辺静電孤立波 (ESW) と、その近傍のプラズマ環境の解析

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Analyses of electrostatic solitary waves (ESWs) and surrounding plasma environment observed by Kaguya near the Moon

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In KAGUYA (SELENE) LRS[1], WFC-L [2] observes waveforms of plasma waves in 100Hz-100kHz and a lot of electrostatic solitary waves (ESWs) have been observed[3]. Although the orthogonal dipole antennas are generally used in the observations, sometimes a pair of monopole antennas were used. We analyze the plasma environment around the observed regions.

Observed waveforms are fitted to ideal ESW waveforms parallel to the magnetic field and the perpendicular component. The propagation velocities and the potential scales are also evaluated in the case of the monopole observations. This time, the E-t diagrams and velocity distributions near the observed regions like, in the solar wind, above the magnetic anomalies, in the wake boundaries, and inside the wake. The ESWs, the plasma environments, the magnetic fields, and their relations will be discussed.

References

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月周回衛星「かぐや (SELENE)」搭載 LRS[1] の WFC-L 波動観測装置 [2] では、100Hz-100kHz の波形を観測でき、多数の静電孤立波 (ESW) が観測されている [3]。通常は直交ダイポールアンテナで観測しているが、モノポールアンテナによる ESW の解析も続けてきている。今回はプラズマ環境 [4] の解析も加える。

観測された波形を、理想的な ESW 波形や、その生成過程と考えられている磁場に垂直な成分を含めて近似し、さらに、モノポール観測の場合には、伝搬速度やポテンシャルのスケール等に関する情報も評価してきた。今回は、太陽風中、磁気異常上空、ウエイク境界、ウエイク内といった ESW が受信されている場所近傍のプラズマ粒子 E-t ダイアグラムや速度分布の解析を加え、ESW とプラズマ、磁場環境との関係を吟味する。

References

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