



SEMINAR 專題演講



國立中央大學 太空科學與工程學系

Department of Space Science and Engineering, National Central University

Time

Friday, February 7,
2025
14:00 – 15:00

A Comprehensive Study of the Fluctuation in the Foreshock Region under the rIMF Conditions

Place

健雄館(科四館)

S4-917 教室
Room S4-917,
Chien-Shiung Building

Dr. Gilbert Pi (畢可為)

Faculty of Mathematics and Physics, Charles University, Czech Republic

When IMF points along the radial direction and lasts long, we named it a long-lasting radial IMF event (rIMF). The rIMF events will lead to an entirely different influence on the magnetospheric system. Therefore, those events caught the scientists' attention. In this study, we will use THEMIS observation to explore the fluctuation in the foreshock region under the rIMF conditions. The foreshock will be generated at the upstream of the quasi-parallel shock. Intuitively, the location of the foreshock shifts into the front of the magnetosphere and covers the entire dayside region. Once the location of foreshock is changed, the whole topology is also changed, and the interaction between the reflected particle and incoming solar wind can be also different from the normal situation under the Parker spiral structure. With the analysis of 16-year observations, the results show that 1. With a fixed θ_{BN} in the foreshock region, the average fluctuation level increases with cone angle; 2. The foreshock region for rIMF conditions extends farther than that for the Parker spiral structure, but the highest fluctuation in the foreshock for rIMF is lower; 3. The average fluctuation level increases with approaching the bow shock under the Parker spiral conditions, but it seems to maintain a constant under the rIMF conditions; 4. Compressibility is increasing in both cases for the low-frequency part ($f < 0.02$ Hz), but it is more significant for the rIMF case.