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Dispersion wave analysis of kink-like and stationary-like current sheet flapping motions in the Earth's magnetotail

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Comprehensive low-frequency multispacecraft wave study of flapping current sheet oscillations in the Earth's magnetotail with different morphologies of oscillation behavior was carried out. Measurements from the Magnetospheric Multiscale (MMS) mission during 2020/08/26 were analyzed. Comparison of the results calculated by methods of phase difference, wave surveyor and Multipoint Signal Resonator technique was performed. It was found that the energy distribution of wavy magnetic field contains complex multi-branch dispersion dependencies on k_y, k_z. The phase velocities of propagation of flapping oscillations were estimated. The applied methods complement each other, and their differences made it possible to assess the presence of nonlinear wave packets and the azimuthal asymmetry of the current sheet profile.

Author: Mr PETRENKO, Bohdan (Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; Space Research Institute of the National Academy of Sciences of Ukraine and the State Space Academy of Ukraine, Kyiv, Ukraine)

Co-authors: A. KRONBERG, Elena (Department of Earth and Environmental Sciences, Ludwig Maximilian University of Munich, Munich, Germany); KOZAK, Liudmyla (Taras Shevchenko National University of Kyiv, Kyiv, Ukraine); AKHMETSHYN, Roman (Taras Shevchenko National University of Kyiv, Kyiv, Ukraine)

Presenter: Mr PETRENKO, Bohdan (Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; Space Research Institute of the National Academy of Sciences of Ukraine and the State Space Academy of Ukraine, Kyiv, Ukraine)

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