

EGU22-5502

<https://doi.org/10.5194/egusphere-egu22-5502>

EGU General Assembly 2022

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On the Generation of Pi2 Pulsations due to Plasma Flow Patterns Around Magnetosheath Jets

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We report observations of a magnetosheath jet followed by a period of decelerated background plasma. During this period, THEMIS-A magnetometer showed abrupt disturbances which, in the wavelet spectrum, appeared as prominent and irregular pulsations in two frequency bands (7.6–9.2 and 12–17 mHz) within the Pi2 range. The observations suggest—for the first time to our knowledge—that these pulsations were locally generated by the abrupt magnetic field changes driven by the jet’s interaction with the ambient magnetosheath plasma. Furthermore, similar pulsations, detected by THEMIS-D inside the magnetosphere with a 140 s time-lag (which corresponds to the propagation time of a disturbance traveling with Alfvénic speed), are shown to be directly associated with the ones in the magnetosheath, which raises the question of how exactly these pulsations are propagated through the magnetopause.

This research is co-financed by the Greece and the European Union (European Social Fund - ESF) through the Operational Program “Human Resources Development, Education and Lifelong Learning 2014–2020” in the context of the project ULFpulse (MIS: 5048130). C. Katsavrias and I.A. Daglis acknowledge the European Union’s Horizon 2020 research and innovation programme “SafeSpace” under grant agreement No 870437. S. Raptis and T. Karlsson acknowledge support from SNSA grant 90/17.