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A role of long period (1-5 mHz) magnetic field fluctuations in substorm development. A case study of the spectral parameters of ULF fluctuations before substorms with no evident trigger in the interplanetary space.

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Our recent study of auroral substorms which develop with no clear trigger in the interplanetary space (Yagova et al, 2017) raises a question about possible physical mechanisms leading such substorms. Two suggestions are seemed to be discussable. One of them relates to an ULF trigger in the interplanetary space, while another one is based on processes inside the magnetosphere which might case a substorm generation. The present investigation is aimed on a detailed case study of the fluctuations of the geomagnetic field, plasma and particle flux parameters preceding purely non-triggered substorms, i.e. those with both non-wave and ULF wave parameters fixed at the same level as for non-substorm days.

Yagova, N., Nosikova, N., Baddeley, L., Kozyreva, O., Lorentzen, D. A., Pilipenko, V., and Johnsen, M. G.: Non-triggered auroral substorms and long-period (1–4 [U+202F] mHz) geomagnetic and auroral luminosity pulsations in the polar cap, Ann. Geophys., 35, 365-376, https://doi.org/10.5194/angeo-35-365-2017, 2017.