

Traits of sub-kilometer F-region irregularities as seen with the Swarm satellites - Manuscript review

December 17, 2019

General comment

Provided manuscript focuses on the the distribution characteristics of ionospheric F-region irregularities in the low latitudes. The Authors have replied to previous comments of Reviewers and improved quality of the paper. The study uses 16 Hz electron density observations made by the faceplate on board Swarm satellites of the European Space Agency (ESA). Extensive analysis focuses on absolute ($\text{std}(\text{dNe})$) and relative ($\text{std}(\text{dNe})/\text{Ne}$) density perturbations, but in my opinion presented work does not fully exploits capabilities of the Swarm mission. Keeping in mind that Swarm is a mission dedicated to the Earth's magnetic field, it would be much more interesting from the scientific point of view, if the Authors could provide joint analysis of electron density and magnetic field perturbations.

It is unnecessary to perform joint analysis from the scratch, since that would highly affect the whole concept and structure of the manuscript. But Swarm provides the Level 2 data product dedicated to plasma irregularities, the ionospheric bubble index. Please visit Swarm repository to download the data:

https://swarm-diss.eo.esa.int/#swarm%2FLevel2daily%2FLatest_baselines%2FIBI

Taking example of discussion of irregularity structures observed by Swarm, it would be interesting to how these structures are classified by the plasma bubbles detection algorithm. For instance analysis of Bubble Flag in the product, could provide information on accompanied fluctuations in the Swarm magnetic field registrations.