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On solar sources of interplanetary disturbances leading to high-energy magnetospheric electron enhancements in geostationary orbit

Based on measurements of magnetospheric electron fluxes with energies >2 MeV in geostationary orbits, solar wind (SW) velocity, and geomagnetic activity for the period 1995-2023, a catalog of electron flux enhancements has been compiled. For the events of this catalog, interplanetary disturbances have been determined, after which high-energy electron fluxes (HEEF) begin to increase, and their solar sources have been established. It is found that in 97.2% of cases, one of the solar sources of interplanetary disturbances that led to electron flux increases were high-speed streams from coronal holes (HSSs from CHs), in particular only HSSs from CHs were observed in 52.5% of events, and in the remaining cases, HSSs from CHs were observed together with coronal mass ejections (CMEs) after solar flares and/or filaments disappearance. The average behavior of the HEEF, SW velocity and geomagnetic activity indices for events associated with the arrival of an HSS from CH to the Earth is obtained. It is shown that electron flux enhancements events associated with interplanetary disturbances from HSSs from CHs and from CMEs differ in duration and maximum electron fluence.
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