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The referee's comments on "The magnetostatic equilibrium in the magnetosphere and substorm plasma properties" by E.E.Antonova, N.Yu.Ganushkina, and I.L.Ovchinnikov (pages 7-10, this issue)

The energy source supporting persistently the field-aligned currents is still unclear. The authors neglect the solar wind-magnetosphere interaction and suggest instead an azimuthal gradient of plasma pressure as the source of the currents. But the energy stored in the magnetospheric plasma is capable to produce the field-aligned currents for a few hours only.

Authors reply on referee's comments

The mechanism of large-scale dawn-dusk electric field support by azimuthal plasma pressure gradients has the same energy source as the other mechanisms - solar wind interaction with the Earth's magnetosphere. The main difference with Dungey and Axford and Hines mechanisms and their modifications is connected with the requirement of existence of hot plasma in the magnetospheric trap. During prolonged northward IMF orientation plasma sheet bifurcation and decay take place, plasma pressure gradients disappear and the mechanism stops working. Correspondingly, dawn-dusk electric field also diminishes. So the energy stored in the tail magnetic field due to existence of the tail current can be continuously replenished by solar wind energy without MHD generator acting in the boundary layers as the tail current and magnetopause currents constitute unite current system, which parameters depend on the IMF orientation. The main advantage of discussed mechanism is the possibility to explain the maximal values of dawn-dusk potential drop in the inner magnetosphere regions and not on the polar cap boundary which, in accordance with experimental observations, lies some degrees poleward of polar auroral oval boundary.