

Energy balance in the formation process of global ionospheric current system closing via the FAC system in the magnetosphere

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Formation process of global ionospheric current system in the context of magnetosphere-ionosphere coupling is formulated. In this formulation, the field aligned current is not only closing via the divergent part of Pedersen current but also via the divergent part of Hall current and via the displacement current induced between ionosphere and Earth's surface, having an important role in the energy balance of Joule dissipation, Hall current generation, and global ionospheric potential formation, respectively. By using this formulation, we clarify the energy transmission process from magnetospheric generator to the ionosphere through the field aligned current and their loading process into global ionospheric current formation.