



Thermosphere and ionosphere response on seismogenic disturbances of the global electric circuit

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Conditions of warm, humid and ionized air over the active tectonic faults favor the formation of clouds and generation of the intense vertical electric current between the Earth and ionosphere. The latter arises due to separation and vertical transport of the oppositely charged particles by the gravity force and pressure gradients. Additional transport of charged particles into the ionosphere causes disturbances of the ionosphere plasma (under the action of the electric currents in the E-layer and electromagnetic plasma drift in the F2-layer) and thermosphere neutral gas (via the momentum transfer from electric to neutral particles). The thermosphere and ionosphere variations formed under the action of the electric field created by this vertical electric current have been calculated by using the Upper Atmosphere Model (UAM), and a good agreement was found between observed and the UAM calculated perturbations of the electric field, electron and ion concentrations, total electron content (TEC), ion and electron temperatures as well as wind velocities and neutral gas temperature and concentrations. The roles of the internal gravity waves and electromagnetic plasma drift in generation of the seismogenic TEC variations are discussed.