



## **Decrease of the electric field penetration into the ionosphere due to low conductivity at the near ground atmospheric layer**

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It is well known that lithospheric electromagnetic emissions are generated before earthquakes occurrence. In our study we investigate the physical penetration mechanism of a pre-seismic electric field from the Earth's surface into the ionosphere. A simplified approach is determined by using the electro conductivity equation, i.e.  $\nabla \cdot (\hat{\sigma} \nabla \cdot \Phi) = 0$ , in the case of a vertical inclination of the geomagnetic field lines. In our model the three dimensional behaviour of the problem with a finite earthquake preparation zone in both directions is investigated. Particular interest is given to the vertical profile of the electric conductivity from the Earth's surface up to the topside of ionospheric F-layer. Our results are discussed and compared to the models of Pulinets et al. (1998) and Grimalsky et al. (2003).