Atmospheric electricity coupling between earthquake regions and the ionosphere

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The concept of the Global Atmospheric Electric circuit is discussed, in terms of a possible mechanism linking seismic activity with ionospheric changes above the epicenter. Observed pre-seismic variations in the natural extremely low-frequency (ELF) radio noise in the topside ionosphere can be explained by the proposed mechanism, through the increased electrical conductivity of surface layer air before a major earthquake, reducing the surface-ionosphere electrical resistance. The increase of the electrical conductivity enhances the vertical fair weather current and height of the ionosphere to maintain continuity of electron flow. Estimated magnitudes of important parameters are consistent with observations. Practical application requires careful consideration of natural variability in the ionospheric and atmospheric electrical properties.