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Multi-parameter observations of pre-earthquake atmospheric signals and their validation. The LAIC concept.

Multi-parameter observations of pre-earthquake atmospheric signals and their validation. The LAIC concept.

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We are carrying out a scientific framework involving multi-sensor observations in our investigation of phenomena preceding major earthquakes. The recent catastrophic earthquake in Japan in March 2011 has provided a renewed interest in the important question of the existence of precursory signals preceding strong earthquakes and their physical validation. We describe a possible physical link between atmospheric observations with earthquake precursors using the latest Lithosphere-Atmosphere-Ionosphere Coupling model, the physical concept that we are validating. LAIC model explains the synergy of different ground surface, atmosphere and ionosphere processes and anomalous variations, which are usually named as short-term earthquake precursors.

We demonstrate our approach based on integration and analysis of several atmospheric and environmental parameters that were found associated with earthquakes. The newly developed approach named as Interdisciplinary Space ? Terrestrial Framework (ISTF) permits to identify the precursory phenomena in seismically active areas. The observations included in ISTF are: thermal infrared radiation, radon/ ion activities; air temperature and humidity and a concentration of electrons in the ionosphere. We present our findings of the retrospective thermal radiation precursory detection for more then 100 earthquakes (M>6) occurring in 2004-2011 over Taiwan and Japan including the latest M9.0 great Tohoku earthquakes of March 11, 2011. The cause-effect relationship between different types of precursors united by physical basis of the LAIC model is the main advantage of the presented ISTF approach

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