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Thermal neutrons' observations before the Sumatra earthquake

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Long-term observations near the Earth's crust have shown that thermal neutrons are very sensitive regarding different processes both in the near-Earth space and in the Earth's crust. The reason of it is the dual nature of the thermal neutron flux. Its first source is bound up with the high-energy particles of cosmic rays penetrating into the Earth's atmosphere and interacting with its elements, so its contribution must reflect the processes in the near-Earth space. The second source originates from the radioactive gases contained in the Earth's crust, and its contribution strongly depends on the Earth's crust conditions and reflects geodynamic processes. At the same time changes of the conditions in the near-Earth space can also result in the geodynamic processes and deformations of the Earth's crust. For instance, it was shown that the Earth's crossings of the Interplanetary Magnetic Field (IMF) sector boundaries are accompanied by thermal neutrons' variations. And the strong earthquakes (with magnitude over 6.4) are mainly distributed within the 3-days interval around the days of the Earth's crossings of the IMF sector boundaries. It was suggested that being a very sensitive indicator of geodynamical processes thermal neutrons' variations can be used as earthquakes' precursor. The most important problem is how to separate variations of geodynamics nature from the rest. Sumatra earthquake occurred on December 26, 2004 became one of the largest earthquakes ever recorded. Variations of thermal neutrons were observed in different points (Crimea, Kamchatka) a few days before the earthquake. The variations' peak reached hundred of percentage. It gives an opportunity to determine the characteristics of these variations and to compare them with observations for other time intervals, both with and without strong earthquakes.