



Inhomogeneities of the electric field and Radon emanation in the zone of tectonic faults

Sergey Soloviev and Dmitry Loktev

IDG RAS, Moscow, Russian Federation (soloviev@idg.chph.ras.ru)

Data that was obtained during axial section observations in the zone of tectonic faults show presence of spatial inhomogeneities of atmospheric electric field and Radon volumetric activity. Axial section observations of electric field and Radon emanation were set along and across the Tunkin Basin (Baikal rift zone). Observation points were set 3 to 10 km apart depending on the local relief. Each point was registering for 60 min under the conditions of “good weather”. There were analysed changes in mean strength of electric field and Radon volumetric activity as a function of distance along the axial section. It was found out that volumetric activity and electric field strength change in phase opposition – radon volumetric activity increase results in more intense ionization in near-surface atmosphere and consequently to decrease in the electric field strength. The concentration of Radon in subsoil atmosphere increases, and electric field strength decreases when approaching to rift zones rimming the Tunkin Basin from North and South.

The influence of local increase in radioactive gas concentration on behavior of atmospheric electric field was observed also in the central part of Altai Mountains. “Good weather” observations evidenced long intervals of about a day when electric field strength was negative. Presence of negative electric field under conditions of “good weather” indicates changed characteristics of near Earth atmosphere. Experimental data for the whole period of observations suggest that the instability of the electrical characteristics of the atmospheric boundary layer associated with the geodynamic activity in the region. Changes at two cross sections through the south-eastern boundaries of Chuysky and Kuraysky basins (the central part of Altai Mountains) distinctly show presence of spatial inhomogeneities of atmospheric electric field and Radon volumetric activity. The results of axial section observations can be successfully used when mapping geological inhomogeneities in the Earth’s crust.