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Results of the neotectonic stress state study in the eastern part of Baltic shield

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Recently a caving of the Kovdor quarry south-eastern bort occurred on the Kovdor massif (the eastern part of Baltic shield). This required a careful analyze of the stress field in the massif and a comparison of it with general situation in a region. In spite of weak seismicity at whole on the given territory it is characterized by the presence of earthquakes with M = 4 - 4.4 especially in zones of mining works (for example, events of 16.04.1989 and 17.08.1999 at the Khibiny-Lovoserskyi district). The risk zone is increased as for large industrial facilities AES located there as for big quarries extracting minerals. Kinematic method developed by Gushenko in 1973, 1979 has been applied in order to get the stress fields. The field works were performed during summer of 2009. According to this method vectors of tectonic movements along in fissures have been analyzed and local stress states have been reconstructed demonstrating significant range in orientation of axis of main normal stresses. These local stress states were conventionally correspond to the third rank and by using this information tectonic stresses of the second rank have been reconstructed. In the caving zone the local stress state can be characterized as uniaxial tension that could bring the caving. Previous investigations of the eastern part of Baltic shield were made for peninsulas Sredniy, Ryibachiy, for the White sea islands, at coast of the Kandalakschsky Bay, on the Chibino massif. Tectonic stresses of the first rank were revealed and were characterized as subhorizontal axis of compression and of tension. The compressional axis has the WNW orientation while and the extension axis is submeridional. Our research showed that the compression axis on the Kovdor massif has orientation 98º , angle is equal 15. This is in agreement with the previous results. The reconstructed stress field at whole well corresponds to the major faults Onego-Segozerskiy and Kandalakscha, which are seismic active zones. The present work has been performed under partial support of RFFI grant -07-05-51379-ofi_p.