

Detection of ultra-low-frequency emissions connected with the Spitak earthquake and its aftershock activity, based on geomagnetic pulsations data at Dusheti and Vardzia observatories

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ABSTRACT

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ULF electromagnetic emissions from the Spitak (Armenia) earthquake site have been detected. Observations were carried out at the Dusheti and Vardzia (Georgia) observatories at distances 120–200 km from the epicentre in a frequency range 0.005–1 Hz. It is shown that the emission appears several hours before the main shock and some of the powerful aftershocks and is not connected with geomagnetic pulsations of magnetospheric sources.

1. Introduction

At present, great importance in the study of the earthquake forecasting problem is attributed to electromagnetic phenomena accompanying tectonic processes at different stages of the earthquake site development.

Lately, the term electromagnetic precursors of earthquake (Sadovsky, 1982) has been established, however, not much evidence of these is available so far. Partly, this is due to a lack of intensive integrated studies in this area.

Below are listed the electromagnetic precursors

connected with the processes taking place in the Earth's seismically active area.

(1) Tectonomagnetic effect (Shapiro and Abdullabekov, 1982; Skovorodkin, 1985; Johnston and Muller, 1987).

(2) Change of geoelectric resistance in the earthquake site (Barsukov, 1970; Mazzella and Morrison, 1974).

(3) High-frequency electromagnetic emission (Gokhberg et al., 1980, 1982).

(4) Low-frequency noise emission in the ionosphere, registered by satellite (Larkina et al., 1984, 1988, 1989; Parrot et al., 1985; Parrot and Mogilevsky, 1989; Chmyrev et al., 1989; Molchanov, 1991).

(5) Variations of electrotelluric field (Sobolev and Ponomarev, 1982; Varotsos and Alexopoulos, 1987; Ralchovsky and Komarov, 1988).

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