Geophysical Research Abstracts, Vol. 8, 01903, 2006
SRef-ID: 1607-7962/gra/EGU06-A-01903

A laser interferometer-strainmeter for monitoring the crust movement

V. Milyukov, B. Klyachko, A. Myasnikov, P. Striganov, and A. Yanin

Sternberg Astronomical Institute, Moscow University, Moscow, Russia

(milyukov@sai.msu.ru / Fax: +7-095-932-88-41)

A laser interferometer–strainmeter with a 75-m-long arm has been developed to record and study lithosphere deformations over a wide frequency range. It is located in the Baksan valley of the North Caucasus - one of the Russian regions with the highest level of geodynamical activity. Based on experience gained over ten years of routine observations, the whole measuring system of the instrument has been comprehensively updated. As a result, its technical potentials have been substantially extended and the reliability and quality of experimental data have been improved. The Baksan laser interferometer today is a high-accuracy measuring system with resolution of 3×10^{-13}, capable of carrying out long-term observations and providing reliable and high-quality information about lithosphere deformations over a wide frequency range.

The Baksan laser interferometer operating in the monitoring mode allows changes in the crust stress state to be detected, slow tectonic processes to be monitored, tidal deformations and dynamics of their variations over time to be measured, and the Earth's free oscillations to be studied. Routine measurements provide a means for investigating the seismotectonic features of the region and the effects of global seismic events on dynamic characteristics of nonuniform structures in the region. It is an important application to participate jointly with other researchers in carrying out comprehensive long-term geodynamical monitoring of the Elbrus region with the aim of investigating, estimating, and forecasting possible natural disasters. The limiting sensitivity of the laser interferometer is assessed, and the results from observations are present.

This work is supported by the Russian Foundation for Basic Research under Grant No 04-05-64917.