

## **Dynamics of the glaciers of the Kluchevskoy group of volcanoes: remote sensing data**

Melnikov D.V., Muravjev Y.D.

Institute of Volcanology and Seismology FEB RAS, Petropavlovsk-Kamchatsky, Russia

Glaciers on volcanoes from Kluchevskoy group are strongly influenced by active volcanism. The increase of the volcanic activity leads to the changes in the glaciers' regime. About 30 glaciers, covering the area of 225.2 km<sup>2</sup>, lay on volcanoes from the Kluchevskoy group. We can monitor the dynamic of glaciers' movements using the remote sensing methods.

Two types of satellite data are used in this work. Multi-spectral images (TERRA ASTER, Landsat, EO-1 ALI) were used for the visual control of changes in glaciers contours during the period from 2005 until 2011. We performed the correlation between activation of volcanoes, products of their eruptions (ash, pyroclastic flows, lava flows) and the shape of glaciers.

The second type of the data is satellite interferometry on a base of ALOS PALSAR data for the period from 2007 until 2010. Radar remote sensing methods represent the optimal solution for the research of the dynamic processes covering the large remote areas, difficult to access for the field works. Here we present the estimates of velocities of the Sredny, Erman and apical glaciers of Kluchevskoy volcano. The activity of glaciers at Kluchevskoy group of volcanoes is high; we defined their morphometric parameters and the distribution limits. We suppose that the activity of some glaciers is directly connected to the intensive eruptions of Kluchevskoy volcano.