

Regional crustal deformation and volcanic crustal activity-Sakurajima volcano-

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Periodic anomalous vertical crustal movement in arc-scale tectonic zones caused by subducting plate motion is reported, comparing with volcanic crustal activity in and around Sakurajima volcano, Kyushu, Japan. The 7-8 year periodic fluctuation of crustal deformation in the South Kyushu district, including volcanic activity, is pointed out to be produced by fluctuations in Philippine Sea plate motion based on the arc-scale tectonic deformation. This is due to the fact that both the periodic fluctuation of the vertical crustal deformation along the Suruga-Nankai trough and the temporal change in the amount of volcanic ash ejected by Sakurajima eruptions (Ishihara, 1999) occurred almost simultaneously, showing the same 7-8 year period for 1978-1992. In order to detect the anomalous crustal deformation mode from secular changes in vertical motion, growing geoid-induced bubble decay instability, which provides unstable modes of crustal movement in a special case, is presented. By making a few assumptions to solve this equation, strong instability modes, fluctuations with periods of 16-17 years and a little under 50 years, were detected in tectonic regions along trench and troughs. The effects of these modes on volcanic activities were investigated in Sakurajima volcano. By comparing with these crustal deformations, phase delay relations linked to anomalous crustal event along the trough are pointed out.