Shinmoe peak in the Kirishima volcano group is located in south part of Japan and has been active volcano since recorded history. On January 19, 2011, the Shinmoe peak began to erupt and it developed to explosive eruptions after January 27. Japan Aerospace Exploration Agency (JAXA) carried out emergency observations using ALOS satellite, which has three sensors, PRISM, AVNIR-2, and PALSAR. Two optical sensors (PRISM and AVNIR-2) acquired high spatial resolution images and revealed an appearance of volcanic smoke and an ash fall area. PALSAR can observe the active vent through the volcanic smoke because of its advantage of microwave with long wavelength (L-band, 23.6cm). PALSAR could monitor the growth of a lava dome in the crater. Moreover, we performed DInSAR processing using PALSAR data acquired before and after the eruption, and tried to detect crustal movement associated with the volcanic activities.