The application of ALOS/PALSAR polarimetry data for the extraction of volcanic activity records: Case study on Fournaise volcano

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We report on using ALOS, Advanced Land Observation Satellite, L-band SAR data for monitoring a series of deformations and mapping surface features on the Fournaise volcano during Jun. 2006 - Sep. 2007. Fournaise is one of the most active volcanoes that its continuous monitoring is closely related with residents' evacuation. However, the continuous ground monitoring and the survey are restricted only at near the Dolomieu crater on top and the base of the mountain along a coastline road. For these reasons, it is demanded as fundamental information for disaster prevention that obtaining entire image of ground deformations and a thematic map of activity records throughout the target area. During the study period, there are several small eruptions and a major one on April 2, 2007, which mainly characterized by a collapse of eastern margin of Dolomieu crater and a fissure eruption in the southern foothills. Interferometric SAR images cover the whole target area without vegetation problems and detect characteristic deformation aspects and their changes before, during, and after the major event. As for the mapping of surface features, FBD data provides different aspects among amplitude, interferometry and coherence between HH and HV polarimetry respectively. These differences mainly depend on the character of ground penetration performance of each polalimetry. From these differences we try to extract further information about the ground and subsurface characters for the application of mapping current and past volcanic activity records especially for lava flow routs.