Use of differential interferometry to monitor ground deformation of Mayon Volcano and land subsidence in north of Metro Manila and Bulacan

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The Sentinel Asia Project in the Philippines, which is funded by Japan Aerospace Exploration Agency (JAXA), aims to promote the use of satellite imageries in monitoring and managing disasters in the Philippines. Currently, project involves the use of RADAR Interferometry to monitor ground movement as applied to volcanic deformation at Mayon and ground subsidence in Northern Metro Manila and Bulacan. This paper presents partial results on the ongoing collaborative project.

A series of PALSAR data from ALOS satellite were granted and processed using DInSAR software (Sigma SAR) also provided from the project. The data series cover several years, thus any deformation rate can be calculated if significant (~cm level accuracy). Deformation results from DInSAR at Mayon volcano were likewise correlated using ground based survey grade GPS. In some of the data set, it shows some deformations that were correlated with the GPS data.

The ground subsidence study covers some part of Marilao, Valenzuela and Malabon. Continuous gradual subsidence was observed in the processed InSAR data. Maximum deformations are in the order of 5cm per year. Initial visit in Marilao area, the subsidence part, have very high activity of commercial ground extraction mostly from existing large factories. The deformation maybe attributed to over extraction of water. In order to investigate this fully, a continuous GPS measurement is planned in these areas in order to augment the satellite-based measurements by ground-based method.