Active submarine volcano monitoring with satellite optical sensors

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Shallow volcanic activities near island arc, where one tectonic plate subducts under another plate, interfere with the aircrafts or vessels near the activities, and sometimes trigger tsunami. More than 40 submarine volcanoes shallower than 200m exist mainly West Pacific. Only few submarine volcanoes are monitored periodically. Monitoring submarine volcano is not an easy task compared with land volcano because it is covered by seawater and located in remote area. Satellite optical sensors are powerful tools for monitoring submarine volcanic activities such as discolored seawater, floating material and volcanic plume. Fukutoku-Okanoba submarine volcano, which is located 1,300 km south of Tokyo, is one of the most active submarine volcanoes in Japan. Brightness and color survey of discolored seawater can be done quantitatively by satellite remote sensing even in remote area with low cost. Brightness and color change analysis of discolored seawater was conducted at Fukutoku-Okanoba submarine volcano using ALOS AVNIR-2 satellite optical sensor with 10m ground resolution and three bands in visible region. The brightness was increased and the color was changed from blue to green according to the volcanic activity. It means that submarine volcanic activities can be monitored with satellite optical sensors.