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# Remote sensing of the temperature and the amount of water of volcanic fumarole gas using lidar technique

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Temperature and water vapor (including waterdrops) measurements of volcanic fumarole gas is important to know the activity of volcanoes and to predict eruptions. However, volcanic fumarole gas is usually poisonous and quite high temperature. So, getting too close to the volcanic fumarole for a gas sampling and direct measurement of temperature are extremely dangerous. We, therefore, are developing two lidars for remote sensing; one is a portable Raman lidar for measuring of water vapor and waterdrops in volcanic fumarole and the other is a portable bistatic lidar for temperature measurements of volcanic fumarole gas. In this presentation, we introduce the developing lidars and report results of observation test of fumarole gas that was carried out at Bandaiko (Kusatsu) in October, 2010.

Keywords: water vapor, temperature, volcanic fumarole gas, remote sensing, Lidar