E117-002 **Room: 201B** **Time: May 18 14:00-14:15**

Field observation of 2-D water vapor distribution with a portable Raman Lidar

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Water vapor is one of the most important minor constituents in meteorological phenomenon as precipitation, cloud formation and latent transfer. It is also important to measure water vapor distribution in the filed like forest and volcanic gas. The former leads to understanding forest-atmosphere interaction. The latter is known as an indicator of volcanic activity. Thus, measurement of water vapor dynamical characteristics at various fields is of great significance.

The observation system is developed by RISH, Kyoto University, as a portable water vapor Raman Lidar. Q-switch pulsed Nd:YAG laser (SHG:532 nm, 30 mJ, 20 Hz) is used as a transmitter and backscattered lights are received with a 20.3cm telescope, and then detected by photon counting system for elastic (532 nm), N2 Raman (607 nm), H2O Raman (660 nm) signals, respectively. An observation at volcano by a Raman Lidar started in collaboration with Aso Volcanological Laboratory Kyoto Univsity and Faculty of Science Hokkaido Univsity in 2005. A field observation at locations without access road for vehicles became possible by setting up the Lidar system on a tripod. In this paper, we would like to report on the experiment which carried out at Nakadake, Mt Aso, with a small Raman Lidar on October 2008.

So far, we have obtained estimating water vapor flux in volcanic gas with the 1-D Lidar data and upward velocities by high sensitive video camera. The Lidar system was located in the western (on 15 October) and the southern (on 16 October) edges of the crater of Nakadake, Mt Aso. The Lidar beam was horizontally and vertically transmitted. The beam was also directed to the fumarole and to the off fumarole as a reference direction in order to distinguishing water vapor in between the plume supplied through a crater and ambient atmosphere. 2-D water vapor distribution in each location was successfully measured. Especially, it is first time to measure vertical water vapor distribution, and the results at the western site clearly shows that WVMR(Water Vapor Mixing Ratio) was enhanced at the area near fumarole and the surface of the lake as well as the vertical scan at the southern site is seen that there are two peaks of WVMR, at a distance between 200m and 300m on the lower side and at the area near wall, respectively. In this case, it seems that wind made two paths of water vapor; one way with wind effect, other without wind effect. In addition, we are estimating water vapor flux by combing the upward velocity and horizontal water vapor distribution at the western location. However, there were a lot of the Lidar data which could not calculate increment in water vapor owing to rapid change of meteorological condition. For this reason we need to observe water vapor in ambient atmosphere more frequently to get good Lidar data efficiently.

We are now converting our system into an in-vehicle Lidar in order to observe water vapor spatial distribution in large-scale like mountain areas. We will also notify the first experimental data with new mobile Lidar.