

AHW015-11

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## Stable Isotopes in Precipitation at temporal-special Variation and The Influence of Water-Vapor in Kumamoto

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Water changes its phase which is cycling on the Earth and it is related with various climate systems. However, it is difficult to estimate water balance in hydrological cycle, because amount of water is numerous. Stable isotope in water has been used for hydrological study up to now. Especially, we have considered variation of precipitation isotope ratio reflected by History-of-Precipitation (e.g. situation when water evaporated from surface seawater.) It is useful for explicating atmospheric circulation. However, isotopic study of precipitation including water vapor is not so many. It is necessary to elucidate the isotopic interaction between precipitation and water vapor.

In this study, we have collected rain water every event since December 2008 in Kumamoto Prefecture. Also, we have 5 observation points where rain water is collected every 10~14 days to observe isotopic variation in precipitation. From July 2010, atmospheric water vapor on 1.8 m above the ground has been sampled every week, 4 times a day to observe diurnal variation of stable isotope in water vapor. We have collected 190 precipitation samples and 7 water vapor samples.

Precipitation samples of precipitation measured oxygen isotope ratio until January 2010 and deuterium isotope ratio until September 2009. The range of oxygen isotope ratio in precipitation was  $-13.2\text{‰} \sim 1.2\text{‰}$ . There were seasonal change in precipitation isotope that is high oxygen isotope ratio during winter and low during summer. Spatial distribution of precipitation isotope among observation points were ranged  $0\text{‰} \sim 4.9\text{‰}$ . Water vapor samples can be measured only deuterium isotope ratio by using Chromium reduction method, because water vapor samples collected not only 0.2 ml. Deuterium isotope ratio in water vapor were ranged  $-133\text{‰} \sim 102\text{‰}$ . There was diurnal variation in water vapor, that is low values during daytime and high values during midnight.

In this presentation, we consider time-spatial variability of isotopes in precipitation and the direction of water vapor transport. We also consider the isotopic relations between precipitation and water vapor.

Keywords: precipitation, water vapor, stable isotope