能登半島における新粒子生成の観測
Observation of new particle formation in Noto peninsula

*表野 宏之[1]、松木 篤[2]、木ノ内 健人[1]
*Hiroyuki Hyono[1], Atsushi Matsuki[2], Kento Kinouchi[1]

1.金沢大学 自然科学研究科、2.金沢大学 環日本海域環境研究センター
1.Graduate School of Natural Science & Technology Kanazawa University, 2.Institute of Nature and Environmental Technology, Kanazawa University

Introduction
The process by which new particles (Ultrafine particles having diameter of the range from several nm to several tens of nm) are formed from precursor gases in the atmosphere is one of the main factors that affect the number size distribution of aerosol particles. Since new particle formation is a first step for the aerosol particles to take shape and eventually act as Cloud Condensation Nuclei (CCN), it has important implications in understanding contributions of aerosols on the climate. Recently, studies in various observation sites have pointed out conditions favorable for the new particle formation (NPF). For example, if there are a lot of existing particles in atmosphere, NPF is less likely to occur (Kerminen et al.,2001), because gas molecule preferentially condense to existing particle. However, there have been few reports so far on the seasonality of NPF in coastal East Asia.
Method
We selected Noto Ground-based Research Observatory (NOTOGRO), located at the tip of the Noto Peninsula as observation site mainly for the following reasons. Firstly, the station is away from any densely populated areas such as Kanazawa city, where one can expect less anthropogenic effect from nearby cities. Secondly, we may be able to observe influence caused by the unique monsoon facing the coast of the Japan Sea. Number size distributions of aerosol particles were measured using a scanning mobility particle sizer (SMPS) system that consists of a differential mobility analyzer (DMA, Model 3081) and a condensation particle counter (CPC, Model 3776). The field measurement was conducted from September 2012 to October 2014. In addition, SO_2 gas was continuously measured using (Model, 43B SO_2 Analyzer), from which we calculated H_2SO_4 proxy (Petäjä et al.,2009).
Result&Discussion
Analysis of aerosol number size distributions confirmed that NPF events occurred frequently throughout the year. From two years of observation, some similarities were found in the seasonality of the occurrence frequency. We focused on the variation of SO_2 gas which is considered as the main precursor of aerosol particles. Comparison with the number size distributions revealed that, the values of the H_2SO_4 proxy were high in most cases when NPF events occurred. The daytime maximum values of the H_2SO_4 proxy were extracted and compared among the days with and without NPF. As a result, the values of H_2SO_4 proxy were relatively higher when the event occurred. These results suggested that the conditions favorable for the formation of sulfuric acid vapor are the major factors controlling the NPF in the studied region.

キーワード：エアロゾル、新粒子生成
Keywords: aerosol, new particle formation

