

Observation of new particle formation event at Noto peninsula

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New Particle Formation (NPF) of atmospheric aerosol particle is an important production process which increases the number concentration of the aerosol particles that would act as Cloud Condensation Nuclei and potentially affect the global climate. The measurement of number size distribution of atmospheric aerosol particles was conducted at the atmospheric observation site, NOTOGRO in Noto peninsula, from October 2012 to September 2013. We identified NPF events throughout the measurement period and this is the first year-round observation reported on the NPF events from coastal region of the Sea of Japan. NPF events tended to occur when Condensation Sink (CS) was relatively low. CS is a measure of the amount of preexisting particle concentration and depends on the particle size distribution. Comparing with meteorological parameters, NPF events were concentrated in daytime, which suggests interaction with solar radiation. However, precipitation preceding the event tended to trigger NPF events by lowering CS (i.e. preexisting particle concentration) especially in winter and summer. On the other hand, NPF events observed in autumn and spring tended to concentrate on days with particularly low relative humidity. Above results suggested that, the conditions favorable for the NPF event is closely related to the seasonal climatic features of the measurement region, that is, the winter monsoon in winter, the rainy season and typhoon in summer and anticyclones in autumn and spring.

Keywords: atmospheric aerosol, new particle formation, condensation sink, precipitation, seasonal variation