

## Estimating source of atmospheric aerosols by Sr and Pb isotopes in Noto peninsula, Japan

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Due to the prevailing high pressure system in the Pacific, it has been generally accepted that the air quality near the ground surface of central Japan is relatively unaffected by the polluted air-mass originating from the continent. However, there is increasing number of observations reporting high PM<sub>2.5</sub> episodes even in summer periods. With respect to the origin of such high PM<sub>2.5</sub> episodes, it has been suggested that the polluted continental air-mass may reach the region even in summer especially when certain condition of atmospheric pressure pattern is met. However, it may also be partly explained by the particles originating from domestic volcanoes (e.g. Sakurajima) which are increasingly active in recent years. Therefore, the exact source and contribution responsible for such high PM<sub>2.5</sub> episodes remain controversial.

Stable isotopes of Sr and Pb are powerful tools for fingerprinting as the source areas because minerals and rocks have distinct isotopic ratios depending on their geological development. Also, these isotopes are relatively unaltered by the weathering, transportation, and deposition. Thus, Sr and Pb isotopes are useful tools to estimate source of atmospheric aerosols. In this study, we present the Sr and Pb isotopic ratios of the aerosols collected in Noto peninsula, Japan in July 2014, in order to identify the sources of atmospheric aerosols.

The sampling site is NOTO Ground-based Research Observatory (NOTOGRO) at 37° 45'N, 137° 36'E. All of the samples were collected weekly on the roof of a building (about 15 m high) using a High-volume air sampler (AH-600F, SHIBATA) with a constant flow rate of 700 L/min. Only the coarse fraction exceeding 2.5 μm in diameter was collected on a 12.6 × 16.6 cm<sup>2</sup> SiO<sub>2</sub> filter through an impactor. Filters samples were extracted with 5% HOAc solution. Residual fraction after extraction with HOAc were digested in HF-HCl-HNO<sub>3</sub> solution. Isotopic ratios of Sr and Pb were measured using a Thermo Scientific Neptune multicollector-inductively coupled plasma-mass spectrometer (MC-ICP-MS).

The HOAc-leachate materials are characterized by low <sup>87</sup>Sr/<sup>86</sup>Sr ratios and approach to sea salt value of approximately 0.70918, whereas the HOAc-residue materials have high <sup>87</sup>Sr/<sup>86</sup>Sr ratios. In addition, sample of 16 July (collected from 9 to 16 July) have the highest value and similar to values observed in north China which was indicated to be 0.71432 on average (Nakano et al., 2004), providing strong support that the continental air-mass may reach Japan even in the summer season.

Keywords: Sr-Pb isotopes, Sakurajima volcanic eruption, Transboundary air pollution, Air pollution in summer