

Aerosol chemical characteristics over Dongsha Island in the northern South China Sea

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The sources of aerosol particles over the South China Sea are complex. In this study, we analyzed the chemical components of aerosol particles from Dongsha Island (20°42'07"N, 116°43'40"E) in the northern South China Sea. Daily values of sea salt, mineral dust, sulfate, nitrate, and ammonium salt, and trace element oxides are estimated from chemical analysis of aerosol samples obtained in 2009. Results reveal that sea salt, secondary inorganic particles, mineral particles, and trace element oxides account for values of 13.39, 8.92, 3.21, and 0.83 $\mu\text{g m}^{-3}$, respectively, of the yearly averaged aerosol concentration. The concentrations of mineral particles and the secondary inorganic particles, including sulfate, nitrate, and ammonium salt are relatively high when the northeasterly monsoon prevails (Figure. 1). Backward trajectory suggests that the high concentration of secondary particles mainly originates from Asian countries, including China, Japan, Korea and Taiwan, while mineral particles are occasionally transported from Chinese deserts. Sea salt is identified as the dominant component of the aerosol particles over the island, and can reach as high as 60 $\mu\text{g m}^{-3}$ when the surface wind is strong.

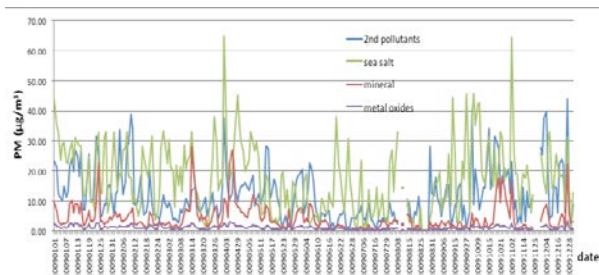


Figure 1: Aerosol time series at Dongsha Island in 2009