

Aircraft observation around the East China Sea area in the spring of 2008 - LEXTRA

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Emission of gaseous and particulate matter in East Asia has been increasing due to the rapid economic growth. Ground observation in Okinawa and Nagasaki shows that high concentration of gaseous and particulate matters are transported from the Chinese continent in spring time. In order to analyze the spatial distribution and chemical compositions of atmospheric pollutants, aircraft observation was carried out in March-April, 2008 over the East China Sea. In this report, observed results and comparison with CFORS (simulation program) will be presented.

The aircraft employed was Beechcraft Kingair 200T. The area for the observation was set between Fukue and Okinawa island. Items of observation were as follows. Gaseous species: O₃, SO₂, NO_y, and CO. Particles: TSP (hi-volume tape sampler), BC (Cosmos), particulate mass and numbers. Temperature and relative humidity were also monitored on board. Round trip flights were made on March 28, 31 and April 1. Level flights were set at 500 m for south bound flights and at 2000 m for north bound flights. Observations of vertical distributions of gaseous and particulate matters were made above Cape Hedo on March 28 and above Fukue on April 2 by circular flights at altitudes of 500, 1000, 1500, 2000, and 3000 m.

On March 28, CFORS predicts that high sulfate band exists between Shanghai and Okinawa. Ozone, SO₂, and sulfate concentrations showed the slightly higher concentration at the mid points between Fukue and Okinawa, which was in accordance with CFORS Model prediction. Higher concentration of SO₂ was observed at 2000m above the Cape Hedo station (CHAAMS), which indicates that the vertical distribution of air pollutants was not uniform.

The typical weather system appeared on March 29-31. The low pressure system with the front passed the East China Sea and the high pressure system moved in near the east coast of the Chinese continent. This is a typical case to observe the high concentration of gaseous and particulate matters. Observation showed that both gaseous and particulate matters were higher at northern area of the flight route, which is similar to the model predictions. For the vertical distributions, SO₂ were high at lower altitude, while ozone was high at higher altitude, indicating that the different air mass was transported from the Chinese continent.