

Simultaneous multi-component measurements by MAX-DOAS at Cape Hedo in Okinawa

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Since the spring of 2007, we have been making a continuous measurement by a new system based on the Multi-Axis Differential Optical Absorption Spectroscopy (MAX-DOAS) at Cape Hedo, Okinawa, Japan. Cape Hedo is a site of our planning network with the primary purpose of detecting a change in tropospheric composition, including both aerosols and trace gases. The MAX-DOAS instrument measures the UV/VIS spectra of scattered sunlight at various elevation angles. The measured spectra are analyzed by a DOAS method and subsequently by a sophisticated retrieval algorithm utilizing an optimal estimation method and a Monte Carlo radiative transfer model to retrieve the vertical profiles of the aerosol extinction coefficient (476 nm) and trace gases (NO₂, SO₂, etc.). In this talk, we present our retrieval algorithm and discuss the retrieved quantities, in terms of diurnal and seasonal variations. In addition, we show that the aerosol extinction was persistently high (greater than 0.2 km⁻¹) for longer than 10 days in late July. This case is analyzed, in detail, using MAX-DOAS SO₂ data, MODIS data, a backward trajectory analysis, and a global model, to show that continental polluted airs can be transported to Cape Hedo even in summer.