Observations of atmospheric ammonia from TANSO-FTS/GOSAT

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Atmospheric ammonia has large impacts on the nitrogen cycles or atmospheric environment such as nucleation of PM2.5 particles. It is reported that ammonia in the atmosphere has been increasing rapidly with the growth of population globally and this trend must continue in the future. Satellite observation is an effective approach to get to know the global perspectives of the gas. Atmospheric ammonia is observable using the thermal infrared (TIR) spectra, and IASI, TES and CrIS had been revealed those distributions. GOSAT also has TIR band including the ammonia absorption bands. GOSAT has the shorter revisit cycle than that of the other hyper-spectral TIR sounders mentioned above, therefore, the shorter time-scale events can be represented. In addition to the importance of the impacts of ammonia itself, the concentration ratio between ammonia and the other trace gases such as CO which is one of the main targets of the GOSAT-2 project is useful as the indicator of their emission sources. In this study, we introduce an algorithm to retrieve the column amount of atmospheric ammonia based on non-linear optimal estimation (Rogers, 2000) from GOSAT spectra in the ammonia absorption band between 960 - 970 cm-1. Temperature and water vapor profiles are estimated in advance of the ammonia retrieval. The preliminary results showed significant high concentrations of ammonia in the Northern India and the Eastern China as pointed out in the previous researches. We will discuss the global distribution of ammonia in the presentation.