

Abstract- Q. Tan

Title: Evaluation of Modeled Vertical Distribution of Atmospheric SO<sub>2</sub> and Sulfate in UTLS

We evaluated the vertical profiles of both SO<sub>2</sub> and sulfate in the AEROCOM Phase II participating models. SO<sub>2</sub> and sulfate show significant concentration gradient in both horizontal and vertical directions. Both online and offline aerosol transport models show large difference in the vertical distribution of sulfur species from surface all the way up to lower stratosphere. Comparison with available aircraft measurements suggests models agree with observations well when SO<sub>2</sub> concentration is high. For the volcanic plumes, the injection height and magnitude determines initial SO<sub>2</sub> plume distribution and following transport pattern. At high altitude, where the background concentration of SO<sub>2</sub> is often below the detection limit of the current aircraft instruments and satellite retrievals, modeled SO<sub>2</sub> and sulfate concentration, lifetime, and budget, as well as their uncertainties can be difficult to be accurately quantified.