Inferring CO_2 Source Regions Using a Lagrangian Transport Model and GOSAT Retrieved Profiles

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ABSTRACT

Retrieved atmospheric carbon dioxide profiles from the Greenhouse gases Observing SATellite (GOSAT) were used in synergy with 3-day back-trajectories of surface and volume influences from the Stochastic Time-Inverted Lagrangian Transport (STILT) model. In this study, terrestrial soundings from GOSAT on the Philippine archipelago as well as on the eastern portion of Malaysia were utilized. Initial results show that potential CO_2 sources maybe identified by aggregating surface and volume influences at different altitude levels. Volume influences also indicate that the measurements maybe impacted by sources from different locations depending upon the wind speeds and directions occurring at the lower and at the upper vertical altitude levels. However, uncertainties are produced when no overlapping influences occur. This makes interpretation of possible source regions difficult.

Keywords: carbon dioxide, satellite, back-trajectories, surface and volume influences, source regions.