3.095 Philippines TCCON Project: one-year measurement results and future.

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Abstract:

TCCON is dedicated to the precise measurements of the total column averages of greenhouse gases (GHGs) such as CO_2 and CH_4. TCCON measurements have been and are currently used extensively and globally for satellite validation, for comparison with atmospheric chemistry models and to study atmosphere-biosphere exchanges of carbon. With the global effort to cap GHG emissions, TCCON has taken on a vital role in validating satellite-based GHG data from past, current and future missions like Japanese GOSAT and GOSAT-2, NASA's OCO-2 and OCO-3, Chinese TanSat, TROPOMI, and others. The lack of reliable validation data for the satellite-based GHG observing missions in the tropical

regions is a common limitation in global carbon-cycle modeling studies that have a tropical component. The international CO_2 modeling community has specified a requirement for “expansion of the CO_2 observation network within the tropics” to reduce uncertainties in regional estimates of CO_2 sources and sinks using atmospheric transport models.

To address this challenge, we installed a newly-constructed TCCON FTS at a wind farm operated by the Energy Development Corporation in Burgos, Ilocos Norte, Philippines (18.5326° N, 120.6496° E), which followed rigorous site assessments and discussions at several TCCON and GOSAT-2 science team meetings. After installation and setup of the instruments in Mar. 2017, we started operations in the Philippines using TCCON protocols. Here, we will show results of one-year of measurements, some interesting phenomena such as CO and CH_4 enhancements, comparisons with GOSAT and OCO-2 soundings, and participation in aircraft observation campaigns such as EMeRGe-Asia and NASA CAMP^{2}Ex.