Estimating biogenic carbon dioxide fluxes in Kantō plain and how it contributes to the update of anthropogenic carbon dioxide emission inventory of mega-city Tokyo

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To check the effectiveness of carbon mitigation policies and verifying reported CO_2 emission reductions from cities, it requires inventory data at relevant spatial and temporal scales (DeCola *et al.* 2017). Atmospheric CO_2 observations from GOSAT (Greenhouse gases Observing SATellite) and GOSAT-2 provide such information for finer inversion analysis to update emission inventory, particularly, in mega-cities like Tokyo, where the largest human-induced carbon source occurs. In addition to anthropogenic emissions, biogenic CO_2 fluxes and atmospheric transport processes (Ahmadov *et al.* 2007) also affect the spatiotemporal variability of atmospheric CO_2 concentrations at regional scale. In summer, forests west and north of Tokyo Metropolis in the Kantō plain generate significant CO_2 fluxes (photosynthesis uptake + respiration release). These land-atmosphere CO_2 exchanges, however, have yet to be realistically simulated in regional atmospheric transport model AIST-MM (National Institute of Advanced Industrial Science and Technology-Mesoscale Model, Kondo *et al.* 2001). This study adjusts BEAMS (Biosphere model integrating Eco-physiological And Mechanistic approaches using Satellite data, Sasai *et al.* 2005) and makes necessary changes to meet the demand of future model coupling with AIST-MM. We have compared our preliminary results (gross primary production and net primary production) and MODIS 8-day GPP product (Running *et al.* 2015). However, as MODIS GPP product's limitation to estimate vegetation carbon capture over heterogeneous terrain is well-known, we will use AsiaFlux data to further calibrate and validate our simulation of biogenic CO_2 fluxes at regional scale.

Key words: urban CO_2 emission inventory, biogenic CO_2 flux, GOSAT/GOSAT-2

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