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## Spatial and seasonal characterization of terrestrial biospheric carbon flux over India using GOSAT data

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**Abstract.** Carbon plays a crucial role in determining the ecosystem balance and slight changes in its concentration in the atmosphere can have significant impacts. The launch of JAXA' s GOSAT (Greenhouse gases Observing SATellite) in 2009 has started a new era of high accuracy CO<sub>2</sub> concentration and flux measurements from space borne sensors. This paper reports the spatial and temporal variability of terrestrial biospheric carbon fluxes over the agro-climatic zones of India derived using GOSAT data for the period June 2009 to October 2011. The country averaged biospheric carbon flux varied from  $-0.47$  (October) to  $0.37$  (April)  $\text{gC m}^{-2} \text{day}^{-1}$ . Maximum variability in fluxes was observed for the North-Eastern region ( $-2.18$  to  $+1.38$   $\text{gC m}^{-2} \text{day}^{-1}$ ) whereas the dry region of Rajasthan showed extremely low values ( $-0.1$  to  $+0.1$   $\text{gC m}^{-2} \text{day}^{-1}$ ). The temporal variation in flux values was compared to averaged NDVI for each zone and indicated that growing season corresponds to more sequestration of carbon from the atmosphere. We compared GOSAT derived biospheric flux with Carbon Tracker (CT) data and observed that the two values show good agreement for all months except June and July. This study provides new estimates of biospheric carbon flux using satellite data driven models to better understand the carbon dynamics associated with terrestrial biosphere over India.

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