National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Meterological fluxes and Aerosol Optical Depth changes during 2021 Similipal Forest Fire events
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Venue	: ER 303 Department Class Room
Date and Time	: 19 Dec 2023 (4:00PM)
Abstract	: Forest fires are one of the most important reasons for societal, environmental and ecological damage. The increase in global temperature increased the proportionality of forest fire frequency, impacting atmosphere and land processes. Studying land-atmospheric flux variability is crucial to scale the aggravating effect of forest fire in understanding the ecosystem dynamics. This study establishes the temporal relationship between atmospheric flux and vegetation responses. The study was conducted for a forest fire episode 2021 over the Similipal Biosphere Reserve in India, Odisha. The study divides the forest fire event into four periods (C1 to C4) from February 20 to March 24, based on the intensity of the fire episodes and the most intense nature of forest fire observed during the C3 phase. To exhibit the spatial/temporal relationships, satellite/reanalysis data products were utilized, vapour pressure deficit (VPD), latent heat flux (LH) and sensible heat flux (SH) from ERA5 land hourly reanalysis data product; leaf area index (LAI) and soil moisture (SM) from SMAP and aerosol optical depth (AOD) from MAIC MODIS products were analyzed to observe the variation in the vegetation dynamics the results for the hotspot period (C3) where AOD had a relatively significant rise. During C3, LH (0.173 W/m²) was observed to be lower than the mean value of C1, C2, and C4 (0.019 W/m²). LAI for C3 (-0.0181) is negative compared with the mean values of other periods (0.0054), indicating a decrease in vegetation density. VPD, a sensitive indicator of the tree, had a higher magnitude in C3 (0.0249 hPa) than in the mean rest periods (-0.0074 hPa). The relationships between these environmental fluxes and forest fire exhibited important insights for land-atmospheric flux variability and aerosol variability in the case of forest fire episodes.