

## Assessment of the intense forest fire over a Southeastern Indian hill station: A case study using ground based and satellite remote sensing data.

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The historic forest fire raged in the third week of March 2014 over Seshachala forest range (13.7°N, 79.35°E) in the Southeastern India that last for several days devastating rare species of flora and fauna in around two thousand hectares of forest land has been analyzed using the Micro Pulse Lidar (MPL) observations made at S. V. University, Tirupati located at the foot hills of the forest range. Earlier studies [1,2] proved that Lidar observations are excellent tool to monitor the forest fire plumes to the surrounding regions. An intense thin smoke plume has been observed on 18 March at 3 km altitude in the lidar back scatter signal on which wide spread fire was identified. These fire has been extinguished using aerial water showers using choppers on 20 March and again the fire raged on 22 March. About 3.5km deep layer of intense lidar back scatter is noticed on 22 March after which it slowly dissipated till 27 March. In addition, the ground based in-situ observations of aerosol physical and optical properties and the Black Carbon (BC) concentrations measured at nearby station NARL, Gadanki (13.5°N, 79.2°E) is combined to investigate the environmental impact of this forest fire. MODIS observed total aerosol extinction and BC mass density show significant enhancement during 22-24 March coinciding with the lidar observations. The back ground wind circulation in the lower troposphere has been analyzed using the high resolution GPS based radiosonde data available at NARL during the fire event to understand the dispersion of the fire smoke. The effect of this fire smoke dispersion on the local environment has been investigated using the WRF-Chem simulations.

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[1] S. Pershin, W.M. Hao, R.A. Susott, R.E. Babbitt . Proc. SPIE. **3757**, 60-66 (1999).