



The development of Haze Events observed by multi-satellite retrievals and Meteorological Analysis: A Case Study over Eastern China in December 2013

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Abstract: With the rapid development of national economy and urbanization, the haze has been one of the environment disasters in eastern China. It is necessary that building a model of monitoring the haze for preventing and solving it in the future. In this study, $NPP/AOT(550nm) > 1$ and $GOCI/AOT(555nm) > 1$ are adopted to dynamically monitor severe haze events in December 2013 over eastern China. Meanwhile, wind field data from CDAS-NCEP/DOE Reanalysis data and air temperature data from CDAS-NCEP/FNL are adopted to study the mechanism of the occurrence, migration and decay of the haze events. The haze event is composed of two consecutive cases. The first case occurred during 4-9 December is an exogenous haze for Yangtze River Delta, whereas the second case appeared during 11-15 December is an endogenous haze.

This result shows: 1) With the improved two-stream approximation model, GOCI is successful used to retrieve AOT with compared AERONET AOT, which demonstrates to be feasible in monitoring severe haze events. 2) Because of the large-scale observation capacity of NPP/AOT(550nm) product ($\times 6km$) and the high temporal resolution of GOCI/AOT(555nm), this study establishes a framework that detect the large-scale haze events using both data sets. 3) Weak wind speed of less than $5 m*s^{-1}$ is important for the development of the haze but the inversion is not a necessary condition for the haze. The strong cold air mass from the northern Siberia area and from East China Sea is the main force for the immigration, diffusion and decay of this haze event. 4) The air quality around Yangtze River Delta in winter is apt to suffer widely divergent influences including exogenous hazes carried by winter northwestward monsoon flows from northern Asia, and endogenous hazes induced by the rapid development of urbanization. The hit of multiple hazes over Yangtze River Delta lead to one of the most severe polluted regions of haze in China.

Key words: $NPP/AOT [U+FF1B]$ $GOCI/AOT$; Haze $[U+FF1B]$ dynamic monitoring $[U+FF1B]$ Meteorological characteristics $[U+FF1B]$