

## **MODIS Dark Target and Deep Blue aerosol optical depth Validation over Bangladesh**

### **ABSTRACT**

This study seeks to examine the aerosol optical depth (AOD) climatology of Bangladesh over the time period 2003-2014 using Moderate Resolution Imaging Spectroradiometer (MODIS) collection 5.1 level-3 data, and Dark Target (DT) and Deep Blue (DB) methods. The results showed that the DT approach was capable of reconstructing the AOD over the whole of Bangladesh, while the DB method was limited only to the eastern, northeastern, and southeastern parts of the country. The AOD derived from the Terra MODIS DT revealed a decreasing trend in the morning, while AOD derived from the Aqua MODIS (DT and DB) showed an increasing trend in the afternoon. The seasonal anomaly of AOD revealed a great variation with different seasons. MODIS (DT and DB) AOD550 data for both satellites were validated with AERONET AOD550 for the period 2012-2013. The validation study showed that the Terra DT ( $R=0.749$ ) performed better than the Aqua DT at 550nm ( $R=0.730$ ). On seasonal scale, Terra DT ( $R=0.841$ ) was found to perform better in winter, Aqua DT ( $R=0.692$ ) in pre-monsoon and Aqua DT ( $R=0.979$ ) in monsoon. The study concluded that MODIS DT product could be used to monitor aerosol over Bangladesh.