Abstract

The air pollution due to particulate matters may cause sever effects on creation or Intensification of cardiovascular and respiratory illnesses. One of the most important pollutants that can be monitored in the atmosphere through remote sensing technology is particulate matter's concentration (PM_{10}). The Purpose of this research is assessing MODIS sensor ability in PM_{10} monitoring in the urban areas and producing daily maps of this pollutant. For this, the MODIS Level 1B-1KM, MODIS Level 1B-250M images were used. Along with these images, pollutant data collected in pollution surveying stations at different parts of Tehran were used. The model is based on the concept of linear spectral unmixing of only two endmembers; surface reflectance without pollution and PM_{10} reflectance in the air. These two reflectances are extracted from MODIS images itself, the first one in a clear day and the second one in a highly polluted day when the surface is completely masked by the pollutants. The results of this work showed that there is an acceptable correlation between model prediction and insitu measurements. This correlation was found to be about 70% with a RMSE of about 132.22 $\mu g/m^3$ between model predicted and insitu measured for Tehran. Comparison of RMSE with those of ground measurement of PM_{10} showed that for low PM_{10} concentrations (about 100 $\mu gr/m^3$) the relative error was high and consequently model exaggerates, while this relative error is low for higher values of PM_{10}. However the existance of acceptable correlation between model prediction and insitu measurements are indicative of the ability of satellite images in helping to monitor air pollution due to particulate matter particularly over urban areas.

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