## Abstract

Air pollution is one of the most important environmental hazards and it has increased strongly due to industrial and development activities. Mapping of the pollution and determine the polluted areas is the most important issue and high priority for decision makers and relevant national and local government. In recent years, remote sensing images are being increasingly used for air pollution modeling. The specific objective of this study is to develop an air pollution model using remote sensing images to determine the concentration and distribution of the main air pollutants factors in cities without spend a huge cost for construction of ground stations. The Landsat's sensors "Contrast Reduction" method for retrieval optical thickness were developed in this study for MODIS sensor in Tehran. In this method, true surface reflectance of clear days are used to calculate the concentration and dispersion of pollutants in a polluted days.

In this study, the relationship between optical thickness and ground station data is established to mapping of $PM_{2.5}$, CO, NO, $NO_2$, $NO_x$ and $SO_2$ by contrast reduction method. The results was 89, 80, 81, 72, 84 and 88 percent respectively that is considered high accuracy due to remote sensing uncertainties. The study is first attempt to use this method in the air pollution modeling by using the MODIS images. The results of this study could be used to help local government and urban decision makers to protect the lives and property of the people of Tehran.

**Key words:** Remote sensing, the concentration of pollutants, contrast reduction, MODIS, Tehran.

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# Mapping of Concentration and Dispersion of Air Pollution's Major factors Using Remote Sensing Techniques and Ground Station Data and Utilizing Geographic Information System

## (Case Study: Tehran Megacity)

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