

Use of optical remote sensing methods for evaluating a dispersion model in Tula's industrial complex in Mexico

Frank Cabrera, Posgrado en Ciencias de la Tierra, Universidad Nacional Autónoma de México (UNAM), 04510 México D.F., México

Roberto Basaldud, Posgrado en Ciencias de la Tierra, Universidad Nacional Autónoma de México (UNAM), 04510 México D.F., México

Michel Grutter, Centro de Ciencias de la Atmósfera, Universidad Nacional Autónoma de México (UNAM), 04510 México D.F., México

A. Wellens, Facultad de Ingeniería, Universidad Nacional Autónoma de México (UNAM), 04510 México D.F., México

Tula's Industrial complex (20.05°N, 99.28°W, 2100 masl), located 70 km NNW of Mexico City, is an important SO₂ emitter in the region due to the high sulphur content in the fuels burnt primarily by a power plant and an oil refinery. In this study, optical remote sensing techniques have been deployed during October 2005 and June 2006 in order to evaluate the performance of the gaussian dispersion model AERMOD used to estimate surface concentrations in the region. Traversals around the industrial complex with a zenith-sky DOAS instrument served to estimate the total emissions used to feed the model and to know the instantaneous spatial distribution of the plume. A Scanning Imaging Gas Infrared System (SIGIS), based on the spectral analysis of passive IR radiation of the plume, was used to visualize the plume's dispersion in 2D and thus determine its vertical distribution. The results from various comparisons between observations and model outputs are presented.