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## Monitoring and analysis of formaldehyde concentration over Rawalpindi-Islamabad Pakistan using MAX-DOAS and satellite observation

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Formaldehyde (HCHO) is an intermediate product in the oxidation paths of non-methane hydrocarbons produced through biogenic activities and anthropogenic sources. Formaldehyde is a flammable, colorless, strong-smelling chemical that is used to produce numerous domestic products and medical preservatives. Formaldehyde is also present naturally in the environment and produced in lesser amounts by most organisms as part of normal metabolic processes. Pakistan lacks the monitoring facilities on a larger scale to measure the atmospheric gasses on regular basis. The study presents the result of atmospheric Formaldehyde vertical column densities (VCDs) obtained from ground-based and satellite observations over Pakistan during the time period of 2014-2015. In order to explore the spatial distribution of Formaldehyde, various field campaigns were conducted by using Car MAX-DOAS instrument in which international scientists were also involved. Level 2 data product of satellite; Ozone Monitoring Instrument (OMI) retrieved by differential optical absorption spectroscopy (DOAS) technique was also compared with ground-based observations. Spatio-temporal distribution of Formaldehyde (HCHO) column densities over main cities and region of Pakistan are discussed. The results show that high Formaldehyde (HCHO) column densities 108 ppm exceeding permissible limit of WHO 83 ppm, were found over twin cities Rawalpindi-Islamabad of Pakistan. The highest VCDs were around  $1.0 \times 10^{16}$  to  $8.5 \times 10^{16}$  molecules/cm<sup>2</sup> higher than WHO guide lines, while in Pir-Sohawa valley where there is less population and vehicular emission; HCHO VCDs were found within WHO permissible limits. Similarly, areas with major industrial activity and high population densities showed high amount of HCHO concentrations.

### Biography

Waqas Ahmed Khan is serving as a lecturer in University of Lahore, Pakistan in the department of Environmental sciences.

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