School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India 110067

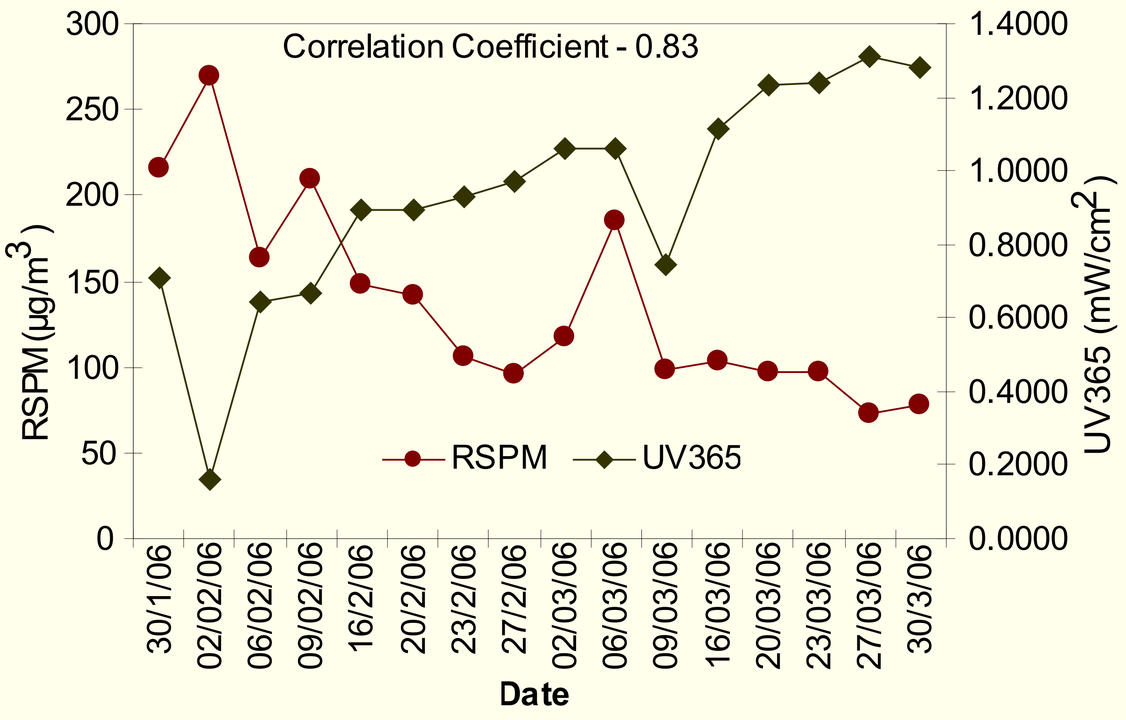
Correlation between Ground Level Ultra-Violet Radiation & Lower Atmospheric Aerosol Load

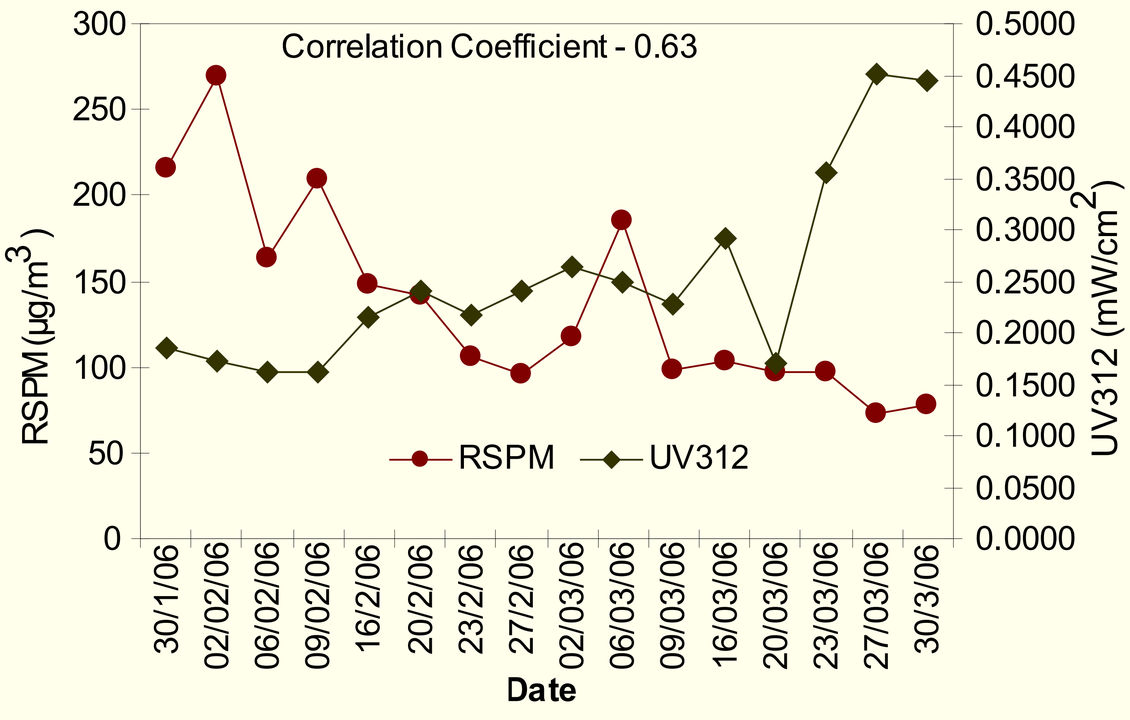
Shweta Yadav and Ankit Tandon

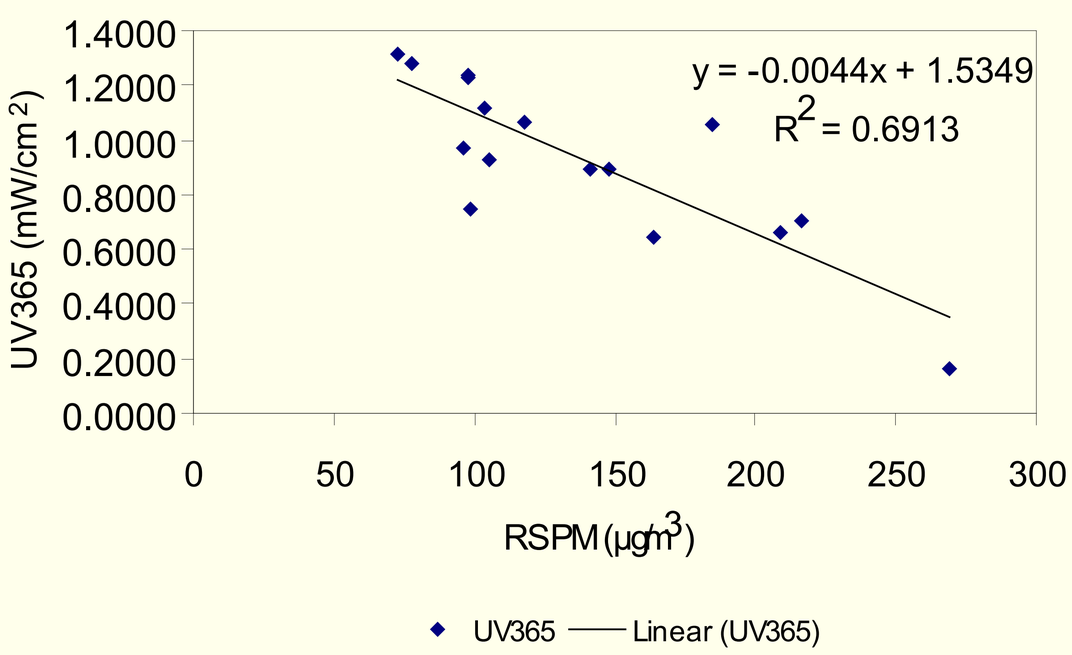
UV radiation is known to affect many biological and chemical processes, and is largely detrimental to individual organisms. Specific concerns include increases in the incidence of skin cancer, ocular damage, and other health effects in humans and animals; damage to terrestrial and oceanic vegetation; changes in the chemistry of the lower atmosphere e.g. photochemical smog formation.

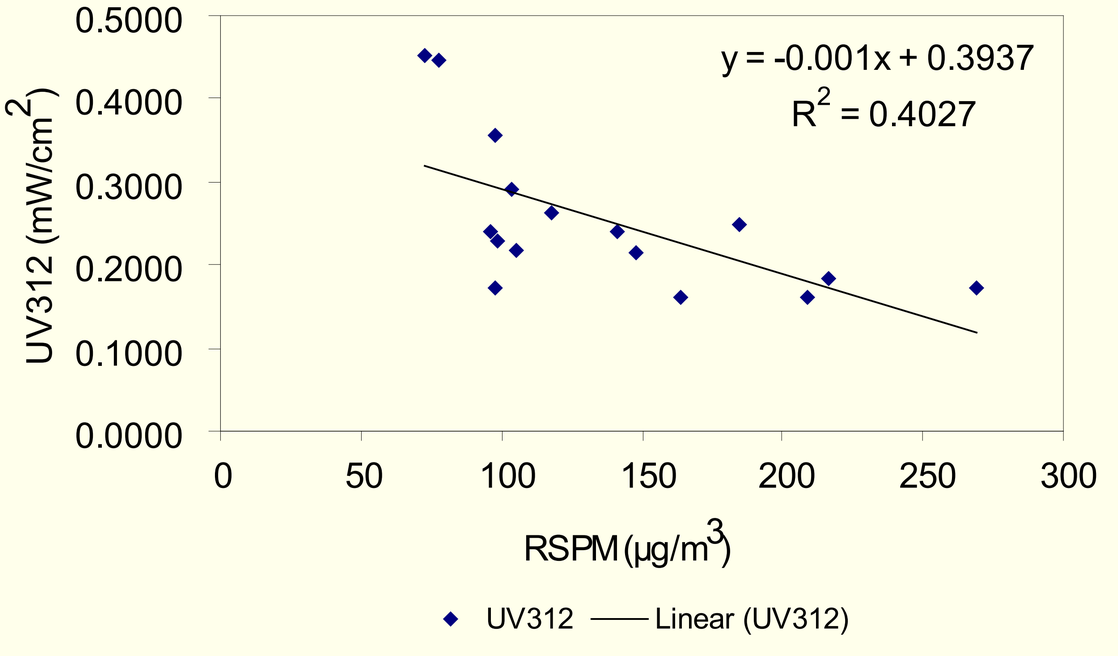
Factors Affecting	Ground Level UV-Radiation (220-380 nm)	Health Effects
Ozone Column • Stratospheric • Tropospheric **Zenith Angle** • Latitude • Day Number • Solar Time **Weather Parameters** • Cloud Cover • Relative Humidity **Atmospheric Pollutants** • Aerosols • Sulfur di-oxide	**UV-A (320-380 nm)** • Not absorbed by ozone layer **UV-B (280-320 nm)** • Partially absorbed by ozone layer • Biologically Active **UV-C (220-280 nm)** • Absorbed by ozone layer	**Skin Cancer (Melanoma & Non-melanoma)** **Premature aging of skin and other skin problems** **Cataracts and other eye damage** **Immune system suppression**

Present study was undertaken to monitor lower atmospheric aerosol load with Respirable Dust Sampler and ultraviolet radiation with UV-radiometer in the ambient environment of Delhi. PM10 and SPM (> 10 µm) samples collected for the period of the study (8 week, 2 samples per week, 16 samples). Hourly UV Fluxes (UV-B & UV-A) were measured from four hours ahead to four hours following the solar noon (LAT 12:00hrs) alongside aerosol sampling twice in a week.

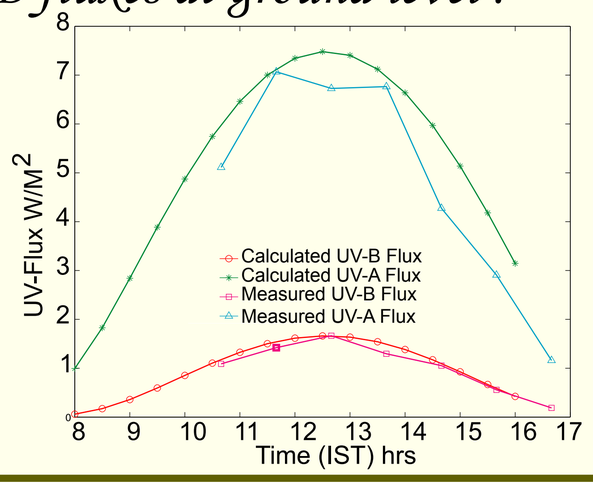








Our study shows, lower atmospheric load of finer particles (PM10) significantly cut-off both UV-A and UV-B fluxes reaching the earth surface. RSPM (PM10) load shows a satisfactory negative correlation with UV-A and UV-B fluxes at ground level .



In addition to above, we have also calculated Ground Level Solar UV-A & UV-B flux using Schippnick & Green's (1982) model with Total Ozone Column and Surface Albedo as input parameters.
We found a good agreement between calculated UV-A & UV-B fluxes with measured UV-A & UV-B fluxes.