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Determining Surface Ozone Concentrations over the Highveld of South Africa using MODIS derived AOD

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The concentration of surface ozone over highly populated regions is of concern for both public health and the natural environment. These concerns are heightened under climate change, with uncertainties relating to the variability in the photochemical relationships of the precursors, and of the synoptic climatology. To monitor the health risks, and better project future surface ozone concentrations under climate change, a high spatial resolution network of air quality measurements is essential. This is particularly important for regions with highly varied synoptic conditions and climatic drivers, as is the case for South Africa. However, the costs and logistics involved in-situ measurements have resulted in a below optimum grid of stations across South Africa. We present preliminary results of the use of MODIS satellite derived aerosol optical depth (AOD) measurements to interpolate surface ozone for the Highveld region of South Africa. In situ measurements of both ozone and climate variables from a network of 20 meteorological stations across the Highveld region, together with daily MODIS AOD data are integrated using the WRF-Chem model, to interpolate surface ozone measurements at a higher spatial resolution that the current ground-based observation network permits. This facilitates a higher resolution investigation of the sources and sinks of surface ozone, and the categorisation of regions of health concern.