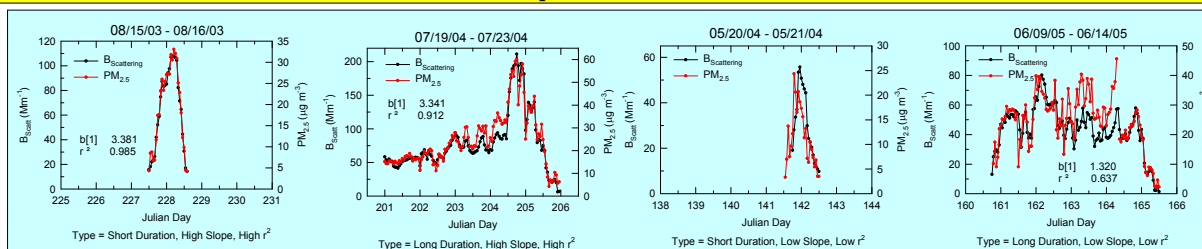
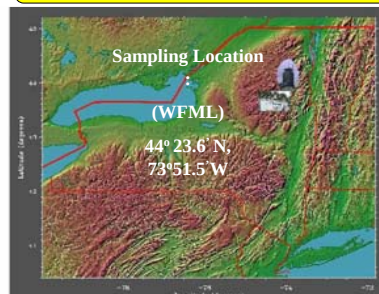


Abstract : Although visibility is well correlated with fine particulate loading in the atmosphere, significant variations in relationship between these two parameters are often observed. Relationships between visibility and the fine particles in the Adirondack region of Upstate New York are explored for selected 'events'. The dependence, if any, of $B_{\text{Scattering}}$ on the chemical compositions of $PM_{2.5}$ are investigated. The measurements were carried out at Whiteface Lodge (44° 23.597' N, 73° 51.531' W, 634 m above msl) as part of PMTACS-NY "Supersite" program.

An event is defined when the peak $B_{\text{Scattering}}$ (Mm^{-1}) is at least three times the monthly mean value along with significant increase in $PM_{2.5}$. The daily averaged chemical compositions during events are obtained from co-located STN measurements. Chemical compositions for all events are not available because of 1 in 3 scheduling of STN sampling.



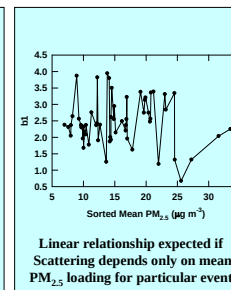
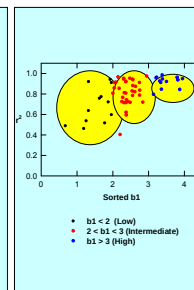
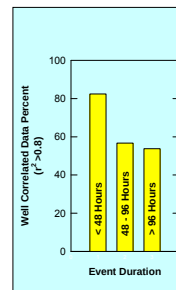
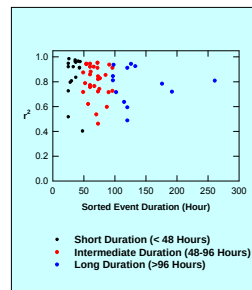
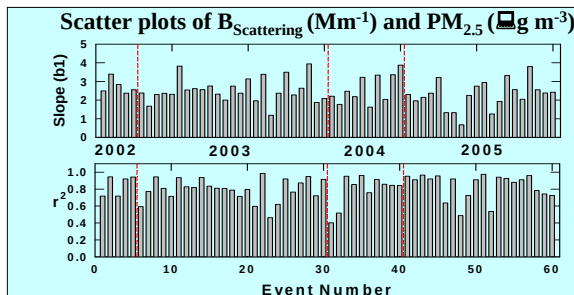
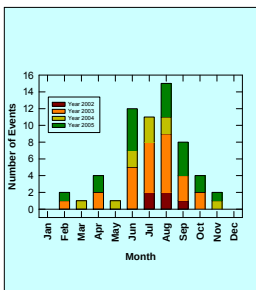
Different Types of Events

Data Period: 07/2002 – 12/2005

Number of Events Considered = 60

Instrumentation:

1. Optec NGN3 Nephelometer
2. R & P TEOM 1400
3. R & P 2300 - Co-located STN Data (1-3 in standard $PM_{2.5}$ configuration)
4. Met Sensors: T, RH, WS, WD, BP

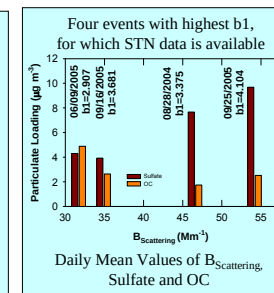
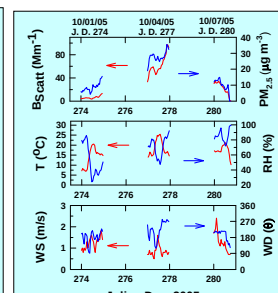
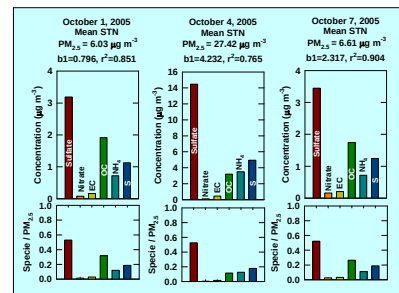
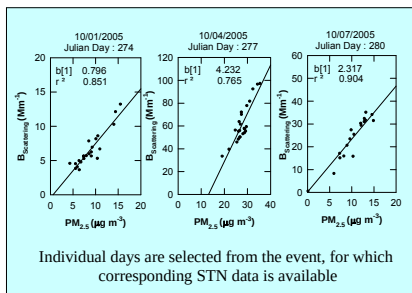
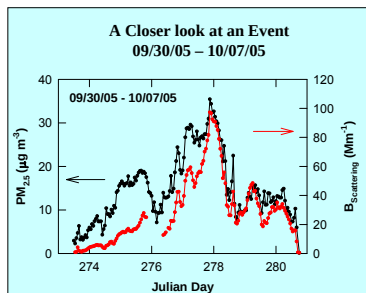


Acknowledgements:

This work was supported in part by the NYSDERDA, contract # 4918ERTERES99, EPA cooperative agreement # R828060010 and NYS DEC, contract # C004210.

Although the research described in this article has been funded in part by the U.S. EPA, it has not been subjected to the Agency's required peer and policy review and therefore does not necessarily reflect the views of the Agency.

Thanks are due to R. Lamica and K. Eckhardt for technical assistance. Thanks are also due to D. Wolfe and S. Kent for logistical help at the WFM field Station.



Summary:

1. Most $PM_{2.5}$ loading and corresponding enhancement of scattering are observed during summer months at the Whiteface Station.
2. The fine particulate loading and the scattering are generally well correlated for short duration events. Longer duration events show variable correlation.
3. The degree of scattering varies significantly from event to event and does not always seem to depend on total particulate loading.
4. Higher loading of Particulate sulfate, in comparison to organic carbon seems to contribute more effectively toward observed scattering. The meteorological parameters seem to have no significant effect on the observed scattering.

Conclusion: Aerosol scattering is generally enhanced by $PM_{2.5}$ loading but the increase in scattering is not always linearly dependent on total PM Loading. Although sulfate particulates seem to contribute more toward observed scattering, size distribution of different chemical constituents need to be explored for quantitative explanation of observed scattering with the loading of the particulates.