Outstanding Needs in UV/Vis

(For O_3, NO_2, SO_2, HCHO, CHOCHO, clouds, aerosols:
Lessons learned from SCIAMACHY, GOME, OMI, and OMPS)

K. Chance

Instrument Design

Reducing "smile", enabling multiple readouts, increasing efficiency, optimizing ITF (slit) shape (especially symmetry), Nyquist sampling spatially and spectrally, ….

Minimal geostationary requirements imply scanning instead of a pushbroom and they imply getting many more spectra onto rectangular detectors than OMI and OMPS have obtained.

Instrument optical and spectrograph design, *including fully informed choice of detector type*, is the single most important outstanding issue in demonstrating the feasibility of geostationary pollution measurements. *N.B. potential PBL O_3 instrument drivers (discrete visible Chappuis and polarization-resolved UV bands). Wavelength range/spectral resolution tradeoffs. O_2 A band ?)*

Characterization

ITF versus cross-track position
Ground footprint
Measurement error covariance (critical for optimal estimation)