

**Demonstrating the Sensitivity of Long-Term Photometric Trends to the Center-to-Limb Profile**

**Courtney Peck** [courtney@peck@gmail.com] and Mark Rast, Laboratory for Atmospheric and Space Physics (LASP), University of Colorado, Boulder, CO, USA

It has been reported (Preminger et al., 2011) that the disk-integrated contrast of visible solar continuum images varies out of phase with the solar cycle, in contrast to surface-magnetism models of spectral irradiance and SOHO/VIRGO measurements in the visible continuum, but in qualitative agreement with SIM visible-band measurements. Since only relative photometry is possible from the ground, contrast measurements are made with respect to a center-to-limb intensity profile. Using nine years of full-disk red and blue continuum images from the Precision Solar Photometric Telescope (PSPT) at the Mauna Loa Solar Observatory (MLSO), we examine the sensitivity of deduced cycle-related irradiance trends to the center-to-limb profile definition employed. We find that the disk-integrated continuum contrast, and the integrated contrasts of the internetwork, network, and active network separately, are highly sensitive to the center-to-limb definition employed. The sensitivity of the center-to-limb profile itself to changes in the Sun's surface magnetism in turn depends on how the profile is constructed, and different center-to-limb algorithms yield contradictory cycle related contrast trends. Radiometric imaging is required to determine the true center-to-limb variation of magnetic structures and unambiguously measure their contributions to solar spectral irradiance variations.