Correction of Scattered Light in Observed Solar Images

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Solar features such as sunspots usually appear darker than surroundings so that they are subject to non-negligible amount of scattered light. In the present study we present a method of correcting the scattered light by assuming that it is made up of long and short range components.

The short range scattered light causes blurrings which reduce spatial resolution and contrast. The point spread function describing this short range scattering has been derived by comparing the
power spectra of granulations observed near the disk center with the published high resolution power spectra. A linear combination of two elliptical gaussian functions is used to fit the data. It is found that the FWHM of the point spread function obtained from the data collected by the Mitaka Solar Flare Telescope ranges from 3.5 to 7.5 arcseconds. The amount of the long range scattered light (stray light) has been estimated from the observed aureole data by using a gaussian stray light function along with a limb darkening law. We derived a model which sets the amount of the stray light as a function of the distance from the disk center. We have found that the long range scattered light is not so sensitive to the adopted stray light function and limb darkening law. Furthermore it does not vary much from day to day. At the region not far from the disk center, the ratio of the stray light to the observed local photospheric intensity is found to vary little, ranging from 0.13 to 0.17. Making use of the derived point spread function along with the estimated fraction of the stray light, we have reconstruct the images of an active region which contains a symmetric sunspot and a pore. It is found that the spot is contaminated mainly by the
long range scattered light while the small pore, by the short range scattered light.

A Preliminary Result of SL-9 Observation with BOAO 1.8m Telescope

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We present CCD photometry of SL-9 impacts on Jupiter between Jul 17 and Jul 20, 1994 UT. It was obtained with 1024x1024 CCD camera mounted on the newly established BOAO 1.8M TELESCOPE. While a serise of CCD images clearly shows most of major impact cites-E, G, H, K and L- at the 8930Å methane band, the impacts of A dna C fragments can be seen as faint spots on Jovian disk, the latter being the more prominent. For a tiny diffuse spot on the limb of the planet which is barely visible on a CCD image taken on July 17 10:55:34 UT, after median filtering, we tentatively identified as D impact cite. Although it is found on the right position, the detection of D impact at BOAO still remains quite uncertain. We employed masimum correlation method to enhance the sharpness in each frame. A more elaborate discussion of quantitative analysis is beyond the scope of present study.