



Stable sunspot area level of Debrecen Photoheliographic Data and multivariate correction factor of SOON data

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Sunspot area data bases play an important role in studies of long-term variations of solar activity. However, some results of these studies may be distorted because of the systematic deviations of the measured areas varying in time. To avoid or eliminate such kinds of errors, there is a need to apply well-determined cross-calibration factors for these data sets. We investigate the spatial and temporal variation of the correction factors between those three data bases of sunspot group areas that are combined with the Greenwich Photoheliographic Results (GPR) for long-term studies in most cases. Our results show that the level of area data of Debrecen Photoheliographic Data (DPD) fits well to that of GPR in the whole solar disk and to that of the Kislovodsk Mountain Astronomical Station (KMAS) except for the near-limb region. This level is quite stable in time and there is no need for conversion between DPD and GPR because the difference between them is only a few percent. However, the area data of the Solar Optical Observing Network (SOON) need a multivariate correction factor to lay them on the joint scale of GPR-KMAS-DPD. The correction factor needed for the SOON data depends on the time, on the distance of the group from the disk centre, and on the site of SOON ranging between 1.1 and 1.9.