M11b The Measurement of Individual Sunspot Proper Motion

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The proper motions of 416 individual sunspots were observed with a triple–exposures method during the periods 1989, 1990, 1992, and 1993. Their positions are measured and analysed. The linear drifts give the mean motions (degree/day), which, depending on the heliographic latitude B, are the differential rotation, W(B) = 14.5 - 2.8 sin2 B, and the equatorward meridional flow, v (B) = -0.11 sin 2B. The deviations of the linear drift from the mean motions have a small correlation between the longitudinal and latitudinal ones, which correspond to the equatorial acceleration. The deviations in longitude are clearly separated by the sunspot polarities. The average separation velocity between the preceding and following polarities is 73 m/s. The drifts of individual sunspots corrected for the mean motion are the smallest for the Zurich GHJ class. However, they are fairly large and may influence the determination of the mean motion.