

M32a Magnetic helicity flux in the solar active region photosphere

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We examined magnetic helicity flux in the solar active region photosphere using vector magnetic field data from the Helioseismic and Magnetic Imager (HMI) onboard the Solar Dynamics Observatory (SDO). The photospheric helicity flux of a given active region was calculated from the formula of the gauge-invariant relative helicity flux derived by Berger and Field (1984), applying the optical flow technique Differential Affine Velocity Estimator for Vector Magnetogram (DAVE4VM) to co-registered pairs of vector magnetograms sampled 12 minutes apart. We will present long-term, large-scale characteristics of helicity flux in the photospheric surface of a few thousand active regions in solar cycle 24. More specifically, we will show how active region helicity flux is distributed with respect to Heliographic latitude, Carrington longitude, solar cycle epoch and Hale magnetic class. It will be also discussed how helicity flux is related to other magnetic parameters and flare productivity of active regions.