

Vector magnetic field measurement and helicity of active regions

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The filter-type magnetograph at the Huairou Solar Observing Station of the National Astronomical Observatory has been obtaining photospheric vector magnetograms on a daily basis for more than 20 years. In this talk we will first introduce our magnetograph and our data reduction routine. Then we focus on what we can learn from these vector magnetic field measurements about the helicity of active regions. Derived physical quantities, such as shear angle, alpha value and current helicity, are good helicity indicators. It is generally believed that magnetic helicity is produced by solar dynamo in the convection zone and its accumulation in the corona would influence coronal dynamics. Our observations thus have the potential to constrain dynamo models and suggest favorable conditions of coronal eruptions.