Simultaneous Filter and Spectrograph Observations of Active Regions with the Advanced Stokes Polarimeter

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Abstract. Solar active regions evolve and decay under the influence of the ambient flow field. To study this interaction, it is necessary to combine vector magnetic field measurements with vector flow measurements. We have obtained a 11–day time series of vector magnetograms with the Advanced Stokes Polarimeter (ASP) of the High Altitude Observatory and the National Solar Observatory (NSO) which has recently become operational at the Vacuum Tower Telescope of the Sacramento Peak Observatory. The ASP measures complete Stokes spectral profiles of the active region at wavelengths near 6302 Åand 5172 Å, with a map requiring about 15 minutes to complete. To complement these observations, we simultaneously measured Stokes filtergrams at 11 different wavelengths through the NSO Universal Birefringent Filter (UBF). The UBF wavelengths were chosen to a) observe the line-of-sight component of the flow through measurement of the Doppler shift of a magnetically insensitive line, b) observe the transverse component of the flow by tracking granules as seen in continuum images, and c) simultaneously observe the vector magnetic field, through measurement of the Stokes parameters in the wings of magnetically sensitive lines. Importantly, the UBF measurements were obtained rapidly, with a complete sequence taken every 100 seconds. We present preliminary results of the analysis of this dataset showing the evolution of the magnetic field of an active region over several hours.

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