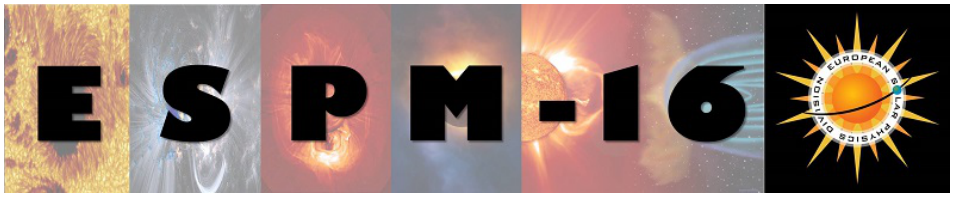

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Observational study of the solar convective pattern in the vicinity of sunspots during their decaying phase.

Wednesday 8 September 2021 09:13 (13 minutes)

The solar photosphere is characterized by the presence of several structures being sunspots the most visible manifestation of the magnetic field immersed in the convective plasma. The study of such active regions in the photosphere includes the analysis of formation, growth and decay of sunspots. These evolutionary processes are directly related to phenomena of solar activity occurring at upper atmospheric layers. High-resolution solar observations have made it possible to study in detail the dynamics of the solar plasma at different spatial and temporal scales, in particular, through time series of images. Sheeley (1969) first reported radial high-speed flows in the convective pattern around sunspots and called it “moat flow”. The study of the moat flow origin is crucial to understand its connections with the structure of the sunspot, for example, the penumbra and their different evolutionary stages. Previous studies have reported links between the moat flow, the Evershed flow and small-scale magnetic elements called Moving Magnetic Features (MMFs). In this work, local correlation tracking techniques are employed over time series of solar images acquired with the Solar Dynamics Observatory in the continuum, in order to study proper motions in the plasma granular pattern in the vicinity of sunspots during the decaying phase and characterize the endmost evolution of plasma flows in the active regions.

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