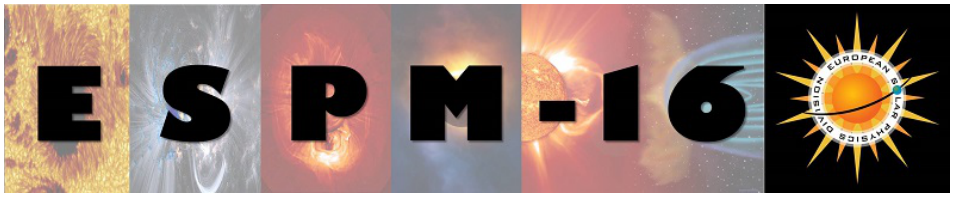

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Power law of coronal jets and their relationship with the solar cycle

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Late-type stars often display multiple and variable levels of periodic magnetic activity. It is well established that our nearest stellar source, the Sun, manifests similar levels of magnetic activity, including the 11-year sunspot cycle discovered two centuries ago. This solar cycle dominates the properties of large-scale phenomena, such as flares and sunspots. However, little is known about how the solar cycle influences the dynamics of localized small-scale events. Here, we report our finding of the modulation of off-limb coronal jets by solar cycles on timescales of both 11 years and 1 year. The modulation is evidenced by the coronal jet butterfly diagram and the quasi-annual periodicities of their intensities, locations and structural characteristics. We also find a power-law distribution of the jet intensity, which is highly consistent with that found for solar and stellar flares. This suggests that the small-scale eruptive events studied here exhibit self-organized criticality similar to their large-scale counterparts.

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