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## 3D oscillatory behaviour of the magnetic helicity flux between the flaring and non-flaring ARs

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The magnetic helicity slowly and continuously accumulates in response to plasma flows tangential to the photosphere and magnetic flux emergence normal to it, it into the solar atmosphere. Analyzing the evolution of magnetic helicity flux at different atmospheric heights is key for identifying its role in the dynamics of ARs. The 3D magnetic field is obtained from PF extrapolations in order to derive the emergence, shearing and total magnetic helicity components at different atmospheric heights.

In this presentation, we show results obtained by analysing the evolution of the three magnetic helicity components in flaring and non-flaring ARs. The evolution of the three components reveals significant periodicities of them. In the flaring ARs, we found that the emergence, shearing and total helicity fluxes have common long periods as a function height in the solar atmosphere. In the case of non-flaring ARs, we do not find such common long oscillatory periods. This case study suggests that the presence of common significant long periodicities could help for a better understanding of the physics of the lower solar atmosphere, and, this oscillatory behaviour may even serve as a valuable precursor for flares.

### Student poster?

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