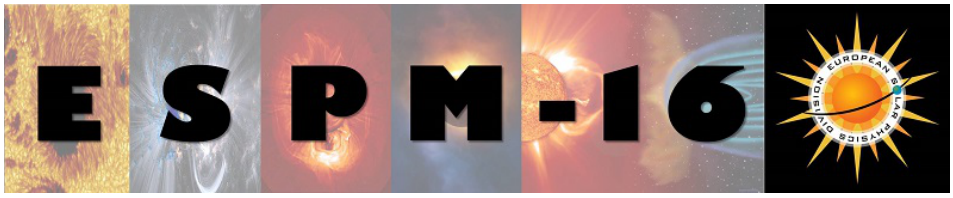

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Direct evidence of a pre twisted magnetic flux rope emerging into the solar corona.

Monday, 6 September 2021 10:45 (13 minutes)

Flux ropes are known to be a critical structure in flaring, jet formation and coronal mass ejections. They can be observed in sigmoidal emission structures and are frequently found in magnetic extrapolations. Two leading theories for their formation are the emergence of pre-twisted magnetic structures from the convection zone and formation above the photosphere due to driving motions around the polarity inversion line. To the best of our knowledge there exists not direct (observational) evidence to conclusively demonstrate on or the other mechanism is responsible for flux rope formation; evidence is generally indirectly obtained by modelling. In this talk I will introduce the concept of magnetic winding, a measure of the entanglement of the magnetic field which can be applied to magnetogram data to directly infer the structure of the emerging field. We demonstrate conclusively with a number of examples that a pre-twisted magnetic field emerges from the convection zone. We anticipate the magnetic winding will become a staple quantity in the interpretation of magnetic field structure from magnetogram data.

Student poster?

Do you want to be considered for a student poster prize?

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