

Nonlinear wave interactions and the cyclic behaviour of the solar magnetic activity.

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Abstract:

The solar magnetic activity is characterized by several quasi-periodic cycles of sunspots that have major effects on Earth's climate and telecommunications. The main sunspot cycle has approximately 11 years and is modulated at longer time scales. Spatially, sunspots are grouped into activity zones that are confined to a belt around the equatorial region of the Sun and drift towards the equator. In this talk we show that much of the spatial temporal behaviour of the solar cycles, as described briefly above, can be modelled as a result of linear and nonlinear dynamics of magnetic Rossby waves at the base of the convective zone of the Sun.