

The role of cancellation in driving small-scale transients and filling coronal loops

C. J. Nelson, R. Erdelyi, M. Mathioudakis

Abstract

Photospheric magnetic cancellation has been shown to occur at the foot-points of a range of transient phenomena (Nelson et al., 2016; Reid et al., 2016), supporting the hypothesis that such events are the observational signatures of magnetic reconnection. Recent results (Chitta et al., 2017), however, have also highlighted the role that cancellation (and, therefore, potentially magnetic reconnection) could play in the filling and heating of coronal loops. In this talk, we will discuss the cancellation of the photospheric magnetic field co-spatial to a range of features in the solar atmosphere, both small-scale and large-scale. We will investigate whether cancellation co-spatial to small-scale transients (e.g. Ellerman bombs) is differentiable from cancellation apparently responsible for the filling and heating of coronal loops. This talk outlines our initial attempts at understanding the fundamental process of photospheric magnetic cancellation and, specifically, how this cancellation impacts on the corona.