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A study of chromospheric and coronal reconnection sites in the aftermath of flux emergence.

Quasi-simultaneous Ellerman bombs and UV bursts have been shown to result from the reconnection of emerging flux with itself when part of the emerging field remains in photospheric heights while the flanks of the retained field rise to chromospheric and coronal heights (Hansteen et al A&A 626, A33, 2019; Ortiz et al A&A 633, A58, 2020). This conclusion was reached using 3D Bifrost numerical simulations and comparison to observations. However, emerging flux and the mutual cancellation of field strands in it do not always result in that type of transient events. In this lecture we discuss a number of instances of such a process of reconnection in emerging flux regions, highlighting the similarities and differences between them and the appearance, or otherwise, of such transient events. To that end, results from a 3D Bifrost numerical model are combined with a-posteriori synthesis of chromospheric, TR and coronal lines.

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