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Characteristics of ribbon evolution and reconnection electric fields in Hα two-ribbon flares

Jürgen Hinterreiter (1), Astrid Veronig (1,2), Julia Thalmann (1), Johannes Tschernitz (1), and Werner Pötzi (2)

(1) University of Graz, Institute of Physics/IGAM, Austria (juergen.hinterreiter@uni-graz.at), (2) Kanzelhöhe Observatory for Solar and Environmental Research, University of Graz, Austria

We perform a statistical study of magnetic reconnection related parameters in Hα two-ribbon flares. 50 flare events, including 19 eruptive flares (i.e. associated to a coronal mass ejection) and 31 confined flares (i.e. CME-less) are analyzed, which are distributed over a wide range of GOES classes (from B3 to X17). The maximum ribbon separation, ribbon-separation velocity, mean magnetic-field strength, and reconnection electric field (i.e., local reconnection rate) are derived from Hα filtergrams obtained at Kanzelhöhe Observatory in combination with co-registered SOHO MDI and SDO HMI magnetograms. We find that the ribbon separation of eruptive flares correlates with the GOES flux and is statistically larger than that of confined flares, whereas no dependence was found for the maximum ribbon-separation velocity and the GOES flux. The local reconnection rate strongly correlates with the GOES flux. In addition, eruptive flares with a stronger peak reconnection electric field tend to be accompanied by faster CMEs. The estimated reconnection-related proxies for confined and eruptive events, however, appear in the form of two distinct but largely overlapping populations. This suggests that there is no significant difference in the underlying reconnection process.