

On the IRIS Signature of Ellerman Bombs

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Ellerman bombs, transient brightenings that have traditionally been observed in the wings of the Balmer H α line, are a ubiquitous phenomenon in the lower atmosphere of active regions with considerable flux emergence. These explosive events have sub-arcsecond fine structure, evolve on short timescales and their energy estimates tend to fall in the nanoflare ballpark. Using SST/CRISP H α data as well as SDO/AIA 1600Å and 1700Å images to confidently pinpoint Ellerman bomb locations, we investigate their signature in observations from the Interface Region Imaging Spectrograph (IRIS). Although not all Ellerman bombs observed in H α result in a perceivable IRIS signal, we do observe coinciding brightenings in both the 2796Å and 1400Å slit-jaw images, with a clear response in the Mg II h & k and both Si IV (1394Å and 1403Å) lines in those cases. We here present an analysis of their time evolution and spectral signature, deriving properties such as densities, velocity shifts and temperatures, and discuss how these fit in the current Ellerman bomb picture.