



Contribution ID: 515

Type: Poster

Diagnostic potential of H ϵ for small-scale energetic phenomena

Wednesday, 8 September 2021 11:13 (13 minutes)

The Hydrogen Balmer lines show enhanced emission in various energetic phenomena in the solar atmosphere. For example, the H α line shows complex wing enhancements in the Ellerman Bomb phenomenon. Recently, Ellerman bombs have been detected in the H β line at high number densities in the Quiet Sun and it was concluded that these mark the ubiquitous presence of small-scale magnetic reconnection. In this work, we explore the diagnostic potential of the H ϵ line, one of the shorter wavelength Balmer lines that promise detection of small-scale energetic events at higher spatial resolution than achieved before. H ϵ is located just redward of the strong Ca H line core which poses a challenge for the understanding of the spectral line formation. To understand the formation of H ϵ , especially the transition from absorption to emission line, we investigate the line formation using 3D radiative MHD Bifrost simulations and NLTE forward modelling with RH. The locations where H ϵ goes into emission mark regions of steep chromospheric temperature enhancements and indicate regions where magnetic energy is released. H ϵ could be therefore a valuable tracer for small-scale energetic events in the solar atmosphere.

Student poster?

Do you want to be considered for a student poster prize?

Primary author: KRIKOVA, Kilian (Rosseland Centre for Solar Physics, ITA, University of Oslo)

Co-authors: PEREIRA, Tiago (Institute of Theoretical Astrophysics, University of Oslo); ROUPPE VAN DER VOORT, Luc (Rosseland Centre for Solar Physics, University of Oslo)

Presenter: KRIKOVA, Kilian (Rosseland Centre for Solar Physics, ITA, University of Oslo)

Session Classification: Poster Session 6.2

Track Classification: Session 2 - The Solar Atmosphere: Heating, Dynamics and Coupling