PRE-FLARE DYNAMICS OF THE FLARING ACTIVE REGIONS IN THE LOWER SOLAR ATMOSPHERE

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We present our method where we focus on the pre-flare evolution of the 3D magnetic field skeleton of flaring ARs. The 3D magnetic structure is based on PF/NLFFF extrapolations and PENCIL MHD code simulations to encompassing a vertical range from the photosphere through the chromosphere and transition region into the low corona. The basis of our proxy measure of activity prediction is the so-called weighted horizontal gradient of magnetic field \(WG_M\) defined between opposite polarities in the entire delta-type sunspot. The temporal variation of the distance of the barycenter of the opposite polarities is also found to possess potentially important diagnostic information about the flare onset time estimation as function of height. We found that at a certain height in the lower solar atmosphere the onset time may be estimated much earlier than at the photosphere or at any other heights. Therefore, we present a tool and recipe that may potentially identify the optimum height for flare prognostic in the solar atmosphere allowing to improve our flare prediction capability and capacity.