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SPECTROSCOPIC INVESTIGATION OF VERY HOT PLASMA IN QUIESCENT OFF-LIMB ACTIVE REGION: SPATIAL AND TEMPORAL PROPERTIES

The thermal structure of active regions and loops is crucial in order to characterize the way these structures are heated. In particular, much attention has recently been devoted to identifying the properties of the high temperature component (> 3MK) of the plasma seen in non-flaring conditions. This, in fact, is the observational aspect which can help to discriminate between the impulsive or steady heating mechanisms. We present results of an investigation which combines rare observations with both SOHO/SUMER and HINODE/EIS of EUV emission in lines from Fe and Ca at high degrees of ionization of a region at the limb. The data cover all ionization stages from Fe X to XIX, which has been used for the thermal analysis (both DEM and EM). Ca XIV is observed in both datasets and it is used for the radiometric cross-calibration. We show how the very hot plasma is present almost everywhere in the core of the AR (up to 1.3 Rsun), and it is persistent in time. The off-limb AR is clearly structured in Fe XVIII, and the EM analysis reveals detected plasma at 10 MK (visible through the Fe XIX emission) which is down to 0.1% of the main 3MK peak. The absence of Fe XIX and Fe XXIII lines (which fall in our spectral range) in other parts of the observed area allow the determination of an upper limit to the EM at such temperatures.