

Stellar magnetic energy release at small-scales - microflares and their relevance for coronal heating

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Recent data analysis of EUV images from TRACE and SoHO/EIT have provided abundant statistics on physical parameters and their occurrence distributions of small-scale phenomena in the solar corona and transition region. The observations indicate that many small-scale phenomena occur in the transition region and lowest region of the solar corona, often revealing a signature of cooling plasma in the 1-2 MK temperature range that is confined in small-scale loops, like miniature versions of larger flares. These phenomena have therefore been aptly named microflares and nanoflares, also supported by the signatures of nonthermal electrons that accompany them. - On the theoretical side, there is the notion that nanoflares occur throughout the corona, in small magnetic reconnection events driven by the braiding of coronal loops as consequence of the random footpoint motion, as envisioned by Gene Parker. In this talk we will discuss the discrepancy between theoretical expectations and observational constraints, as well as discuss future ways to reconcile theory with observations.