



Astrophysics > Solar and Stellar Astrophysics

Continuous upflows and sporadic downflows observed in active regions

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We present a study of the temporal evolution of coronal loops in active regions and its implications for the dynamics in coronal loops. We analyzed images of the Atmospheric Imaging Assembly (AIA) on the Solar Dynamics Observatory (SDO) at multiple temperatures to detect apparent motions in the coronal loops. Quasi-periodic brightness fluctuations propagate upwards from the loop footpoint in hot emission at 1MK, while sporadic downflows are seen in cool emission below 1MK. The upward motion in hot emission increases just after the cool downflows. The apparent propagating pattern suggests a hot upflow from the loop footpoints, and is considered to supply hot plasma into the coronal loop, but a wavelike phenomenon cannot be ruled out. Coronal condensation occasionally happens in the coronal loop, and the cool material flows down to the footpoint. Emission from cool plasma could have a significant contribution to hot AIA channels in the event of coronal condensation.

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