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Solar coronal heating from small-scale magnetic braids

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Relaxation of braided coronal magnetic fields through reconnection is thought to be a source of energy to heat plasma in active region coronal loops. However, observations of active region coronal heating associated with untangling of magnetic braids remain sparse. One reason for this paucity could be the lack of coronal observations with sufficiently high spatial and temporal resolution to capture this process in action. Using new high spatial resolution (250–270 km on the Sun) and high cadence (3–10 s) observations from the Extreme Ultraviolet Imager (EUI) on board Solar Orbiter we observed untangling of small-scale coronal braids in different active regions. The untangling is associated with impulsive heating of the gas in these braided loops. We assess that coronal magnetic braids overlying cooler chromospheric filamentary structures are perhaps more common. Furthermore, our observations show signatures of both spatially coherent and intermittent coronal heating during relaxation of magnetic braids. Our study reveals the operation of gentle and impulsive modes of magnetic reconnection in the solar corona. In this talk, we present these new EUI observations and discuss the implications for magnetic braiding associated coronal heating.

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