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Connecting solar coronal loops to their photospheric footpoints

Magnetic connectivity and its evolution from the solar photosphere to the corona will play a crucial role in the energetics of the solar atmosphere. To explore this connectivity, we use high spatial resolution magnetic field observations of young and decaying active regions from the balloon-borne SUNRISE and the ground-based SST telescopes, in combination with the observations of coronal loops imaged in extreme ultraviolet by SDO/AIA. We show that photospheric magnetic field at the base of coronal loops is rapidly evolving through small-scale flux emergence and cancellation events with rates on the order of 10^{15} Mx/s. When observed at high spatial resolution better than 0.5 arcsec, we find that basically all coronal loops considered so far are rooted in the photosphere above small-scale opposite polarity magnetic field patches. In the photosphere, the magnetic field threading coronal loops is interacting with opposite polarity parasitic magnetic concentrations leading to dynamic signatures in the upper atmosphere. Chromospheric small-scale jets aligned to coronal loops are observed at these locations. We will discuss what role the magnetic interactions at coronal loop footpoints could play in the evolution of coronal loops and their heating.