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# Coronal rain in randomly heated arcades

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Adopting the MPI-AMRVAC code, we present a 2.5-dimensional magnetohydrodynamic simulation, which includes thermal conduction and radiative cooling, to investigate the formation and evolution of the coronal rain phenomenon. We perform the simulation in initially linear force-free magnetic fields that host chromospheric, transition-region, and coronal plasma, with turbulent heating localized on their footpoints. Due to thermal instability, condensations start to occur at the loop top, and rebound shocks are generated by the siphon inflows. Condensations fragment into smaller blobs moving downwards, and as they hit the lower atmosphere, concurrent upflows are triggered. Larger clumps show us clear coronal rain showers as dark structures in synthetic EUV hot channels and as bright blobs with cool cores in the 304 Å channel, well resembling real observations. Following coronal rain dynamics for more than 10 hr, we carry out a statistical study of all coronal rain blobs to quantify their widths, lengths, areas, velocity distributions, and other properties. The coronal rain shows us continuous heating–condensation cycles, as well as cycles in EUV emissions. Compared to the previous studies adopting steady heating, the rain happens faster and in more erratic cycles. Although most blobs are falling downward, upward-moving blobs exist at basically every moment. We also track the movement of individual blobs to study their dynamics and the forces driving their movements. The blobs have a prominence-corona transition-region-like structure surrounding them, and their movements are dominated by the pressure evolution in the very dynamic loop system.