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## Linking 3D and 1D computational models to follow evolution of heated coronal plasma

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A 'proof of principle' is presented, whereby the Ohmic and viscous heating determined by a three-dimensional (3D) MHD model of a coronal avalanche are used as the coronal heating input for field-aligned, one-dimensional (1D) hydrodynamic modelling.

Three-dimensional MHD models cannot afford the computational resources to follow the magnetic field and the thermodynamic transport along field lines with realistic parameters.

From a 3D MHD simulation, we extract the heating along single field lines and use these heating functions for 1D simulations that follow transport of energy.

Proceeding from simple, ordered photospheric motions, this heating is spatially localized, dispersed, and impulsive, occurring in discrete, reconnection-facilitated bursts.

MHD heating is shown to sustain coronal temperatures and densities, around 1 MK and  $10^{14}$ - $10^{15}$  m<sup>-3</sup> respectively, in a 90 Mm loop.

Thermodynamic feedback on the plasma dynamics is limited, and the MHD evolution is largely robust to the field-aligned thermodynamic response.

Advantages and drawbacks of the 3D and 1D models, within their respective spheres, are discussed and compared.

Both models report similar temperature and density, but velocities diverge.

Heating causes strongly asymmetric plasma flows, which differ significantly between 3D and 1D models and may have observable signatures.

Velocities in the 1D model are comparable with 3D reconnection jets in the MHD model.

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