



Numerical simulation of expanding flux ropes

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Expanding flux ropes play an important role in Solar dynamics, i.e. during CME and filament eruption. In order to gain improved insight into the dynamics of such events, a plasma experiment (<http://flarelab.rub.de>) is currently under operation at Bochum University, where discharge currents together with an external magnetic field form curved flux ropes that contain large internal twist. In the course of the discharge, these structures tend to expand with the current pinching into fine filaments that are subject to kink-like structure formation.

We present 3-dimensional numerical studies of the dynamics of such expanding flux ropes in the framework of MHD. Special attention is given to the influence of the mass density distribution in and around these current filaments on the kink formation and the comparison of these signatures with the experiment.