
Reconnection-driven waves and oscillations in the flaring solar corona

A Data Management Plan created using DMPonline

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Project abstract:

The overall aim is to investigate how waves and oscillations are generated by, and during, magnetic reconnection in the solar corona, in large-scale flares and smaller flare-like events associated with coronal heating, and to determine the observational signatures of these waves, particularly associated with non-thermal electrons. The approach is to utilise MHD reconnection simulations coupled to test-particles, and also the complementary Reduced Kinetics2 which more self-consistently models the kinetic and fluid physics. We will use recently-developed scenarios of magnetic reconnection and particle acceleration in solar flares, now focusing primarily on waves and oscillations hitherto largely ignored. The intention is thus to identify and analyse wave activity arising incidentally during reconnection in scenarios relevant to confined flares and coronal heating; conversely, we will not set up models specifically to create waves (thus, oscillatory driving will not be used). Forward-modelling will predict observational signatures, such as hard X-ray, UV, microwave and low-frequency radio emissions.

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Manchester Data Management Outline

- No
- Not applicable
- Yes
- Acquire new data

The project will produce data from numerical simulations

- University of Manchester Research Data Storage
- 1 - 8 TB
- No
- < 5 years
- No sensitive or personal data

Not applicable

- Not applicable
- No
- Not applicable
- No

Philippa Browning

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Data types

The project will produce outputs of numerical simulations in the form of grids of spatially 2D and 3D magnetic fields and plasma variables at successive times, also particle distributions.

Published data will mainly be analyses of these larger datasets.

Data preservation

Simulation outputs of production runs will be retained.

Also the codes from which the data are produced will be retained, with setup files

The main software used are publicly available LARE code, and GCA and RK codes which will be available on request.

10 years

Data sharing

Output files of key simulations will be retained and will be publicly available.
Codes to repeat the analyses will be available on request.

No proprietary period.

The data will be available as created, with documentation.

Resources

No additional resources required.