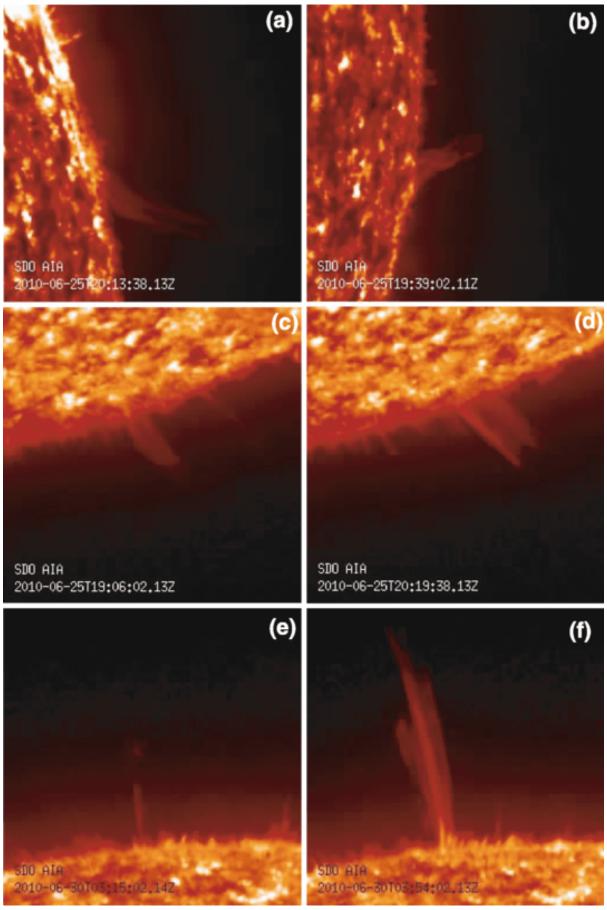
SELECTED FIGURES FROM THE ACHIEVEMENT OF THE OBJECTIVES DURING THE JET-CME PROJECT.

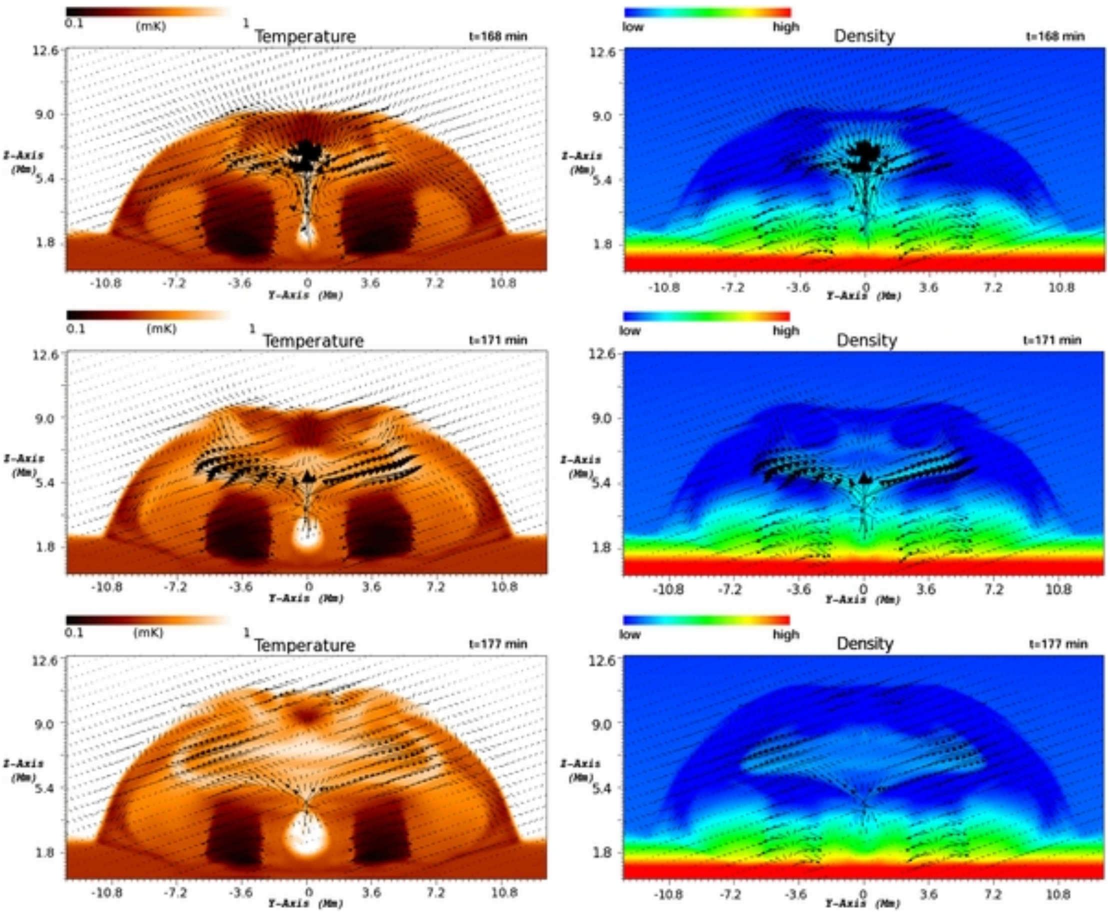
a) The acceleration mechanism of large-scale jets in the Sun.



AIA 304 Å snapshots of the jets analyzed in this paper. (a) North-West Jet, (b) South-West Jet, (c, d) "precursor" and "main" Southern Coronal Hole jets, (e, f) "precursor" and "main" Northern Coronal Hole jets. The snapshots were taken at the approximate maximum extent of the jet. The times are shown on the figures.

Source: Paper No 3 in the list of publications (see publications.docx).

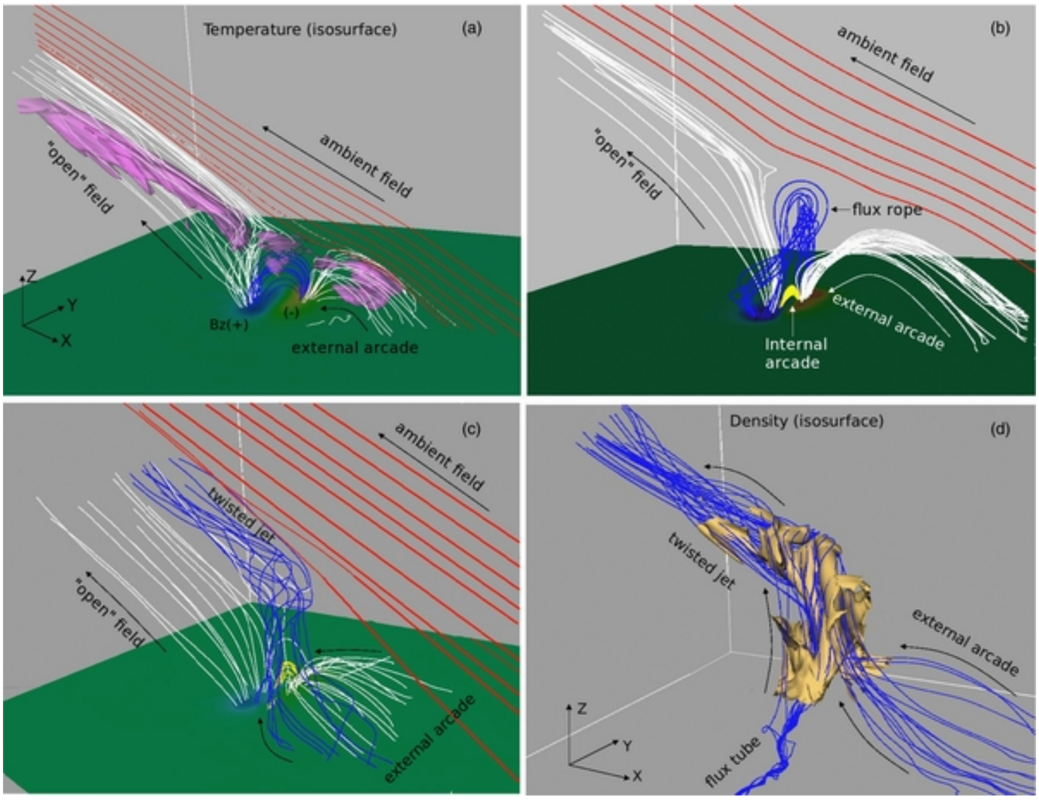
b) The effect of the twist on the emergence of magnetic fields from the solar interior to the solar atmosphere and the formation of jets.



Left: temperature distribution at the x = 0 Mm slice. Arrows show the projected velocity field onto the plane. Right: the same for density. Non-twisted emerging fields interact and produce jets and heating at the interface.

Source: Paper No 2 in the list of publications (see publications.docx).

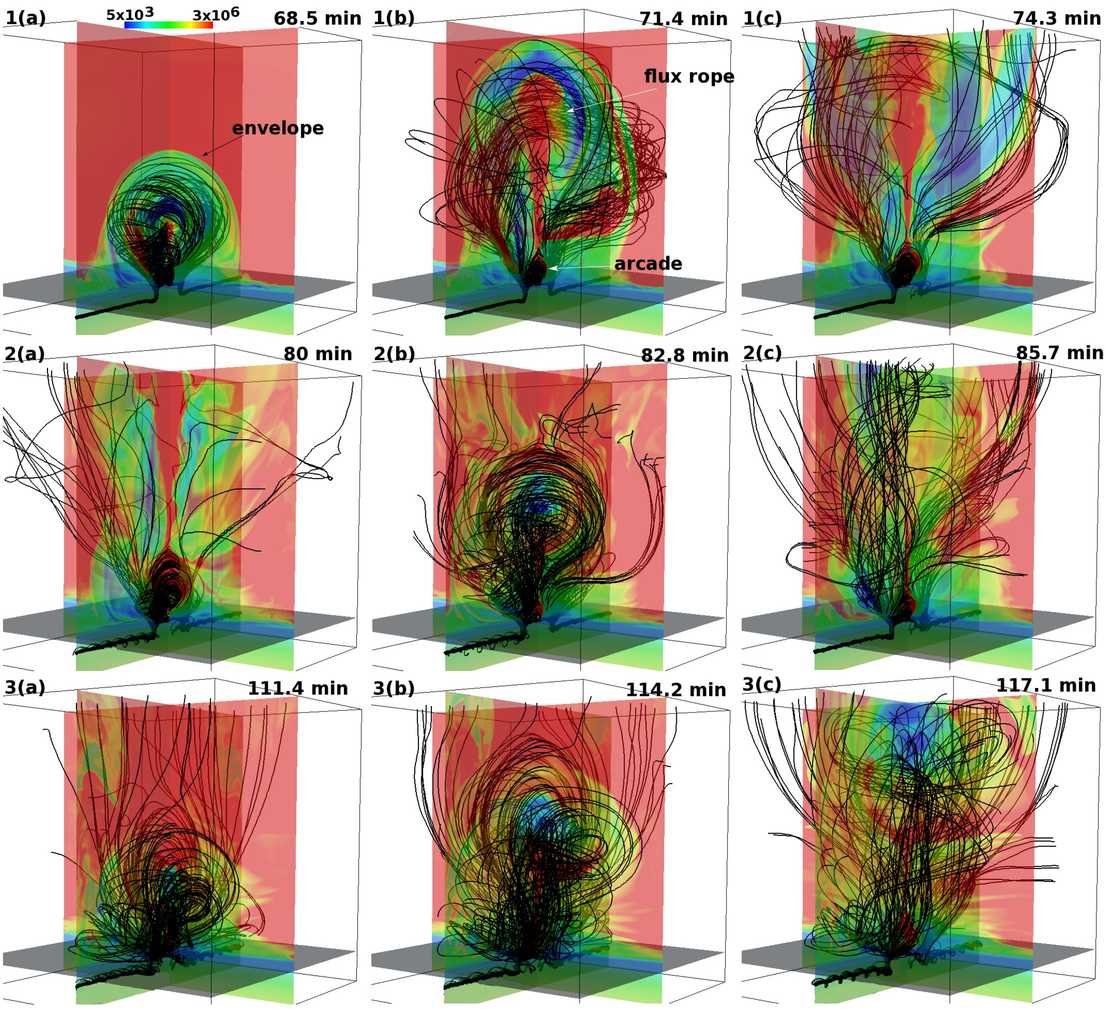
c) The onset of CME-like eruptions in emerging flux regions and their possible relationship to jets.



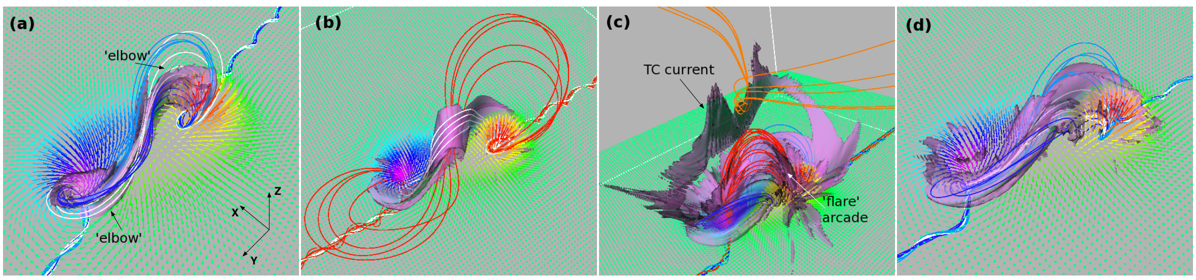
3D topology of fieldlines during the emission of the jets at t = 37 minutes (panel (a)), 52 minutes (panel (b)), and 53 minutes (panels (c) and (d)).
Isosurfaces represent temperature (T >= 3 mK; panel (a)) and density (2 × 10^(-13) g/cm^3; panel (d)). The arrows show the direction of the magnetic fieldlines and indicate the various flux domains.

Source: Paper No 4 in the list of publications (see publications.docx).

d) The relationship between CME-like eruptions and sigmoids.



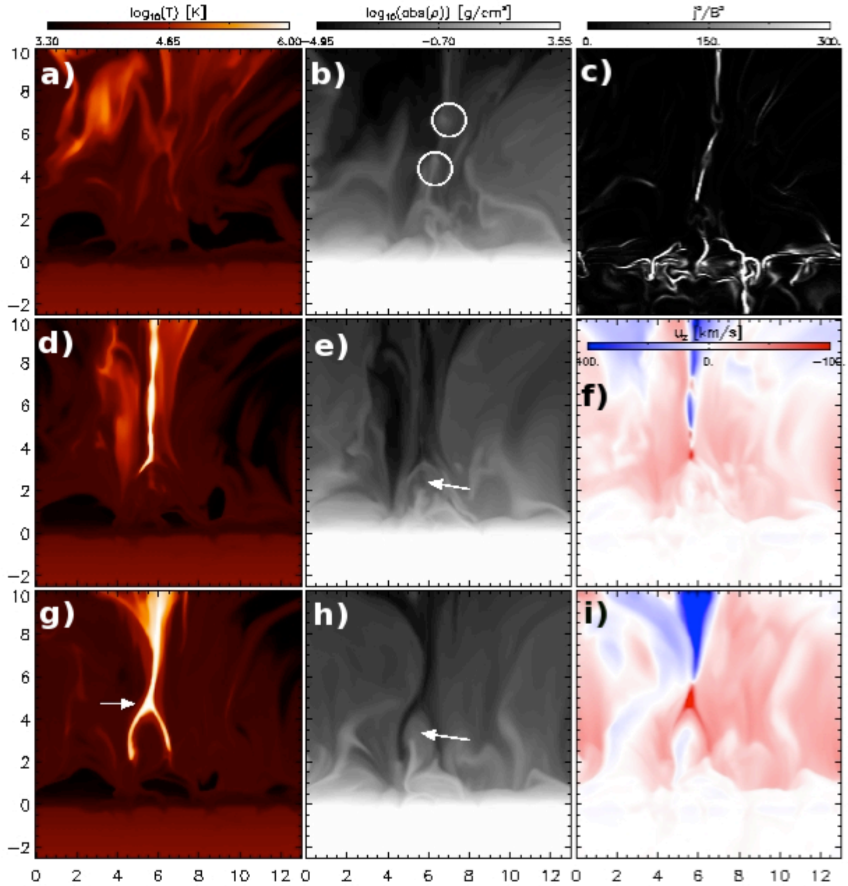
Temperature and magnetic field topology during the CME-like eruptions.
Shown are the two vertical midplanes and the horizontal slice at the base of the photosphere.



The sigmoid-to-arcade transformation during the first CME-like eruption (panels a-c) and the reappearance of a sigmoid before the second eruption (panel d).

Source: Paper No 1 in the list of publications (see publications.docx).

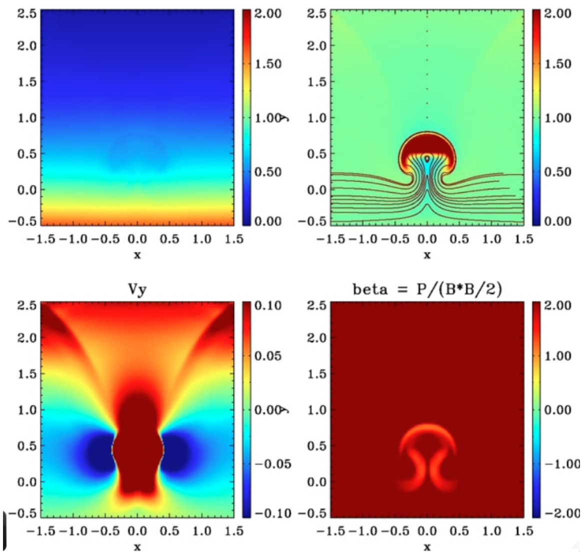
e) Preparation of flux emergence experiments in three dimensions including thermo dynamical terms in the energy equation such as thermal conduction and partial ionization.



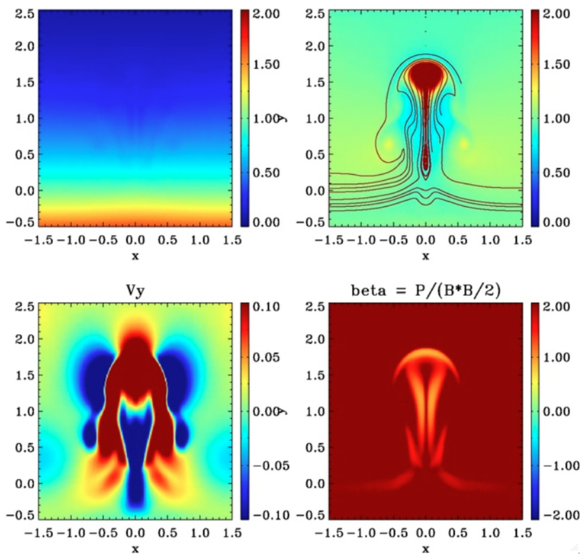
2D slices showing the temperature (a,d,g), density (b,e,h), current(c) and vertical velocity (f,i), across the interface between two interacting magnetic bipoles. Flaring (d,g) and emission of jets (f,i) occur during reconnection between the oppositely directed fieldlines of the interacting magnetic fields. Times are t = 8530 s, t = 8750 s, and t = 8930 s (top to bottom).

Source: Paper No 7 in the list of publications (see publications.docx).

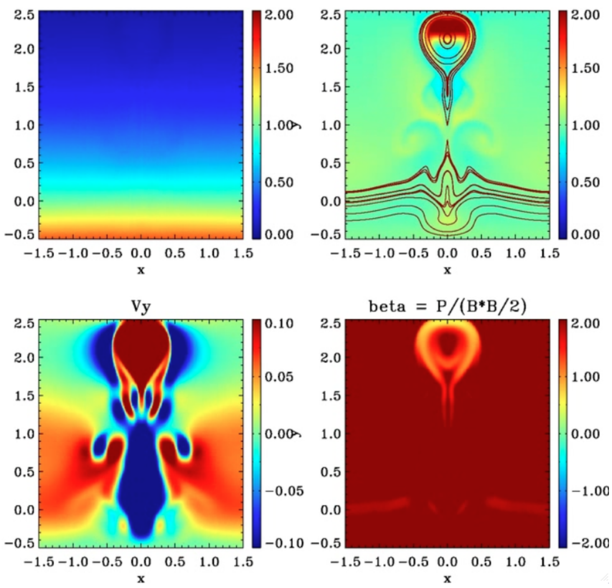
f) Preparation of the experimental/code set-up for the launching of jets from accretion disks around young stellar objects.



2d slices showing gas pressure (top-left), temperature and magnetic field-lines (top-right), Vy (bottom-left) and plasma beta (bottom-right). This is a close-up of the box, which is located at an accretion disk. The magnetic field emerges (it becomes buoyantly unstable) adopting an Omega-like shape.



The same quantities as above at a later time. The emerging field continues to rise and it is stretched vertically. This dynamic evolution will lead to reconnection at the stretched fieldlines at the lower part of the emerging field.



The reconnection in a tether-cutting manner leads to the eruption of the emerging field, similar to the CME-like eruptions in the Sun. Moreover, a bidirectional flow (reconnection jet, see Vy) is emitted underneath the erupting core of the magnetic field. This experiment reveals that small-scale eruptions and jets could be produced in accretion disks around YSO, in a similar manner to the Sun.

Source: Paper in preparation.