Guest Investigator Final Report

Project Title: **EUV/Xray jets from coronal holes and the origin of the solar wind**

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Date of visit: From: 03/2013 *to:* 10/2013

Project Abstract:

The model boundary conditions of space weather and the space weather forecast itself are entirely dependent upon solar observations and, especially, on the knowledge about the origin of solar wind. The regions of open magnetic field lines on the Sun, coronal holes, have been firmly established as the main source of the high-speed streams of the fast solar wind (800 km/s). In contrast the source of the dense, highly-structured and sporadic slow solar wind has not yet been identified (400 km/s). The basic physical processes which could explain the magnetically driven plasma outflows of the fast/slow solar wind also remain a fundamental mystery. Very little has been done to track either the slow or fast solar wind in the low solar corona and transition region where most of the solar-wind related activity originates. We aim at investigating EUV/X-ray jests as well as active region outflows and their expansion into the solar wind. We obtained SWAP off-point observations which will provide unique possibilities to follow jets and outflows at far-away distances. The observations were co-ordinated with Hinode/EIS/XRT/SOT. We are presently starting to analyse the data and later we will compare them with 3D MHD modelling on jets and outflows from active regions.

Primary ROB Contact(s): Matthew West & Dan Seaton

Which Instrument(s) was/were used: SWAP

Were other instruments used in collaboration with PROBA2?

Yes

(Optional) Description of collaboration:

EIS/SOT/XRT/Hinode

Was there a dedicated observing campaign performed or planned?

Yes

(Optional) Description of campaign:

Two Hinode/SWAP campaigns including Hinode all three instruments in March and October 2013

Brief Description of work performed during the visit:

A proposal for a new Hinode HOP study was written and submitted to the Hinode science commission before the visit in late 2012. The proposal included scientific and technical details on the requested observations. After the approval Maria Madjarska has coordinated the observing campaign both in March and October. During the visit the target was decided by Maria Madjarska and Klaus Galsgaard and communicated and agreed with the Hinode and SWAP teams. After the successful observations (very well coordinated both spatially and temporally) The SWAP data were downloaded and reviewed. K. Galsgaard presented during a seminar at ROB a 3D MHD model of jets which will be compared with possibly registered jet-like events during the observing campaign. In addition active region outflows (from the newly obtained data) will be studied and compared with a new data-drive model developed by Klaus Galsgaard based on data provided by Maria Madjarska.

Future Plans:

Data analysis and comparison with 3D MHD modelling

Has this work been published?

Planned

If so, Where? Reference/DOI? ADS Link?

Please add below any other comments you might have:

The work is ongoing and is not in a stage to be presented publicly. As soon as the first results are obtained we will inform the SWAP team.