

JOSO NATIONAL REPORT 2002-2003 -CROATIA

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1 Research

The energy release process in solar flares has been investigated and it was found that the causal relationship between the soft and hard x-ray radiation (Neupert effect) indicates a significant role of the thermal conductivity. A 2.5 -D magnetic reconnection process has been analyzed and it was shown that in the transition to a small transversal field the system becomes very sensitive to small perturbations and probably becomes turbulent. A standing magnetosonic shock wave in a reconnection jet has been considered as an important factor in the acceleration process of particles. Observational confirmation of standing shock waves was established analyzing dynamic radio spectra of flares. The study of the kinematics of CMEs has been extended to more than 5000 events. Special attention was paid to the interaction of the ejecta with the ambient magnetoplasma and a mechanism for the escape of particle beams into the interplanetary space from the region of the associated flare was proposed. Properties of the Solar velocity field indicated by motions of coronal bright points observed by the EIT on board SOHO were investigated. Rotation velocity residuals, meridional motions and their relationship were analyzed. It was found that the rotation residuals show a pattern consistent with the torsional oscillations. For a subsample consisting of "point-like structures" - predominantly young bright points, an equatorward transport of angular momentum was found.

2 Observations and Instruments

The joint project "Case studies of emerging magnetic flux in Solar active regions" was continued. The chromospheric telescope has been equipped with a new H-alpha filter (Solar Spectrum, 0.2 Å passband width) in June 2003. A

digital imaging system consisting of a Pulnix TM 1010 camera, optical link and image processing software has been purchased. The digital imaging system will be assembled and tested in collaboration with the Kanzelhöhe Solar Observatory in spring/ summer 2004.

3 Scientific Meetings

The VIth Hvar Astrophysical Colloquium " Explosive phenomena in the Solar Atmosphere" was held at Hvar 6-10 October 2002. The contributions presented at the Colloquium are published in Hvar Obs. Bull. 2003, Vol 27, No.1,1-214.

4 Collaboration

The scientific collaboration was continued with the :

- Astronomical Institute of the Czech Academy of Sciences, Ondřejov
- Astrophysical Institute Potsdam
- Kandilli Observatory
- Institute for Geophysics, Astrophysics and Meteorology, Univ. Graz
- Kiepenheuer-Institute for Solar physics, Freiburg
- Metsahovi Radio Observatory
- Astronomical Observatory Trieste
- Meudon Observatory
- NASA GSFC, Maryland

A joint (Hvar. Obs.- IGAM Graz) project "Investigation of Various Aspects of the Solar Rotation" has been approved in the frame of the bilateral scientific collaboration between Austria and Croatia for the period 2004- 2005.

An agreement on collaboration with the Astronomical Institute of the Slovak Acad. Sci. ,Tatranska Lomnica has been signed for the period 2003-2006.

5 Solar observing facility in operation

Hvar Observatory : Latitude : 45° 10' 39",05 Longitude : 16° 26' 51",56

Altitude : 239 m

6 Names of people involved in Solar research

6.1 Hvar Observatory

- Roman Brajša : Solar rotation, flares and assoc. phenomena, prominences
- Vladimir Ruždjak : flares and assoc. phenomena, prominences, Solar rotation
- Bojan Vršnak : flares and assoc. phenomena, prominences, CMEs, Solar rotation

6.2 Zagreb Astronomical Observatory

- Drago Roša : Solar rotation

6.3 Names of newcomers

- Damir Hržina : Solar rotation (Zagreb Astron. Obs.)
- Darije Maričić : CMEs (Zagreb Astron. Obs.)
- Jasmina Magdalenić : radio fine structures, shock waves (postgrad., Hvar Obs.)
- Domagoj Ruždjak : Solar rotation, CMEs (postgrad. Hvar Obs.)
- Davor Sudar : Solar rotation, CMEs (postgrad. Hvar Obs.)
- Marina Skender : reconnection in flares (postgrad. Inst. Rugjer Bošković)