

SW Measurements

Ground versus Space instruments

Alcatel Consortium

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Ground-based observations for Sun

- Forecasting, Nowcasting and Postevent analysis
- Clear distinction SW and research needs
 - Choice of instruments
 - Instrumental performances
 - **Selection** and priorities

Sun General recommendations

- **24h coverage** **high priority to Space** even when possible from Ground
- **Established operational network**
 - **Development of identical and well-calibrated instruments**
 - **Coverage in longitude and latitude range (visible)**
 - **Climatic conditions tested for seeing → 6 optical equipments**
 - **Financial aspect Ground versus Space not obvious**

Needs for sun observations

- Magnetic field

Forecast activity, onset,
modelling (2'', 5 gauss, 15min)

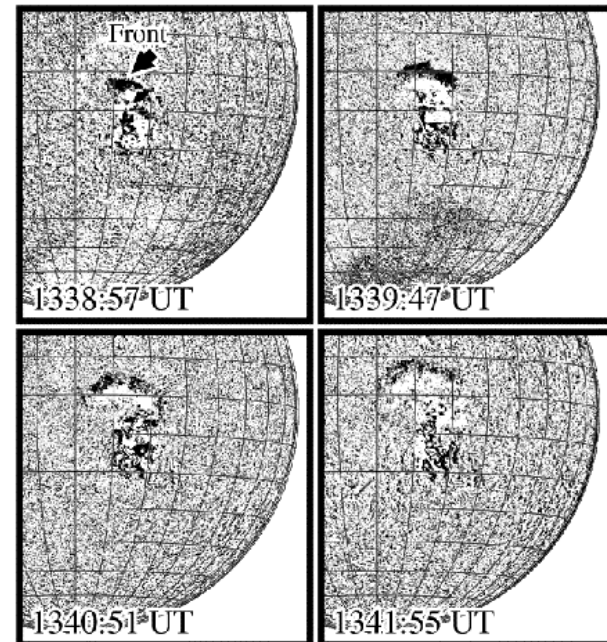
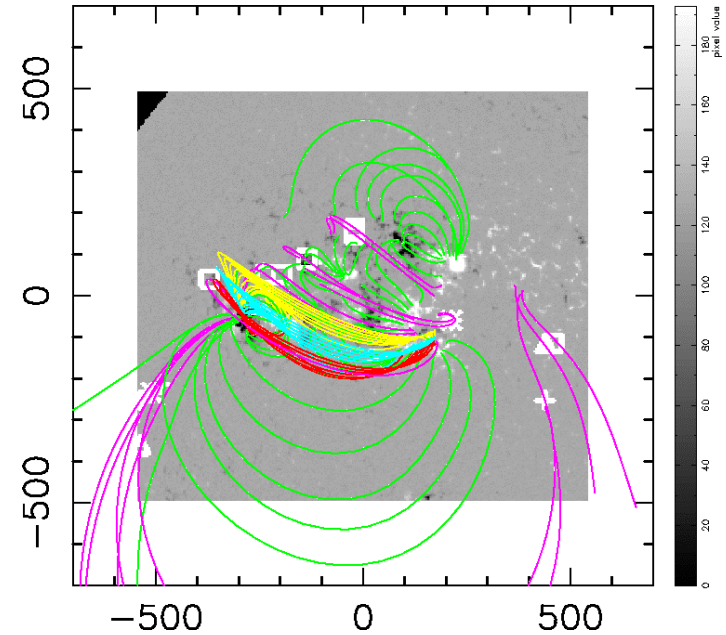
- **Priority for space**

- Halpa line and off

Geoeffective CMEs

Flares and eruptive filaments,
Moreton waves (30sec)

- **High Priority for space**



Needs for solar radio observations

High cadence and span huge range of altitudes

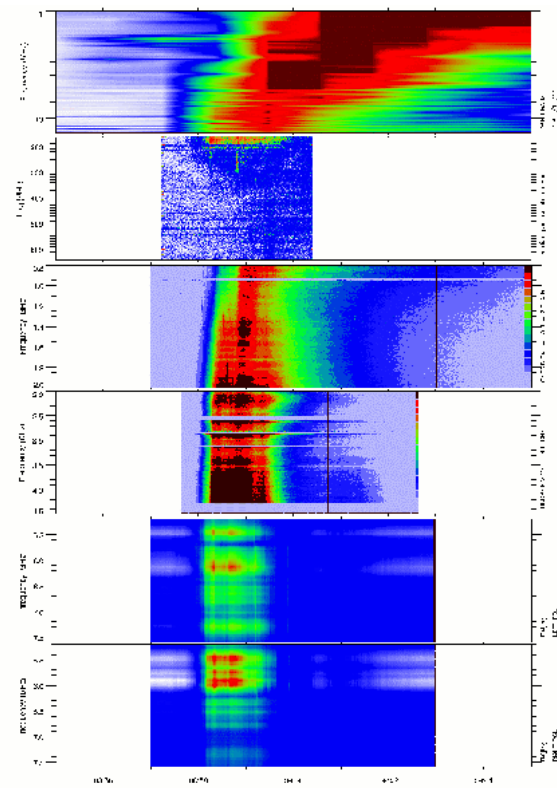
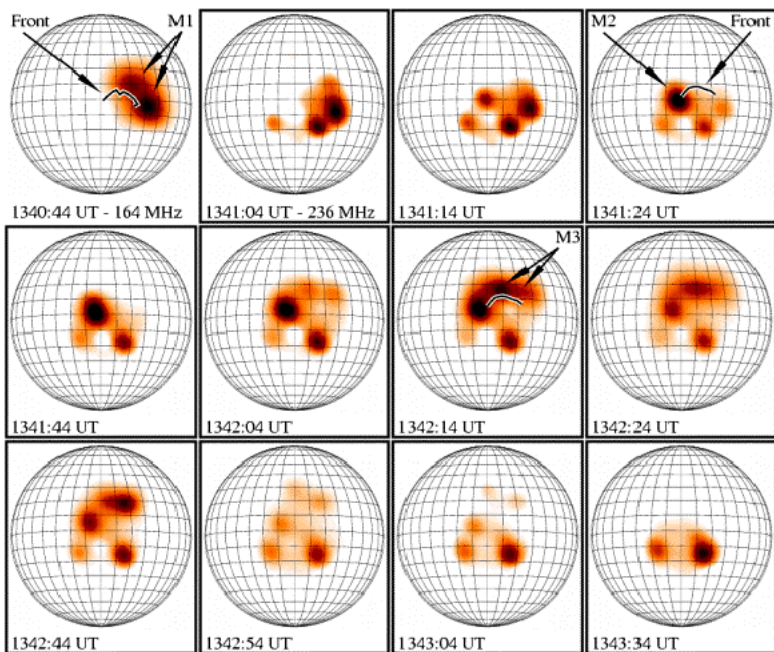
- **IMAGING**

- disk and limb CME progression

Shocks, SEP, beams....

- **SPECTROGRAMS**

Shocks, SEP, beams....



Wind
Porto
Ondrejov
Ondrejov
Beijing

Sun Existing networks

B field and Halpha observations USA

- **GONG**

- 6 sites in 6 Longitudinal range B long,
- 87% coverage

- **SOLIS**

- One site: Vector spectromagnetograph and Halpha (2002)
- Two other ones recommended NAS/NRC report

- **ISOON US air force facilities**, will remplace SOON

- 4 sites: Vectormagnetographs and Halpha telecope ??

- **BBSO**

- 4 sites Halpha network, **Seeing ???**

SUN Recommendations

- *** Full disk H α** Complete existing network **6**
(1.1 ME) **space**
- *** Full disk B** Complete existing network **6**
space
- **Radiospectrographs** Network 20GHz- 40 MHz **3**
(0.8ME)
- **Radio imaging** Network 2GHz- 70 MHz **3**
(7 ME) (FASR)
- *** Ground-based: Canary Island European Observatory**

Interplanetary medium

- **Muon network**

Forecast geomagnetic storms several hours in advance (CME signatures)

Gap in northern atlantic/european region **close by the Greifswald (if no 200 kE)**

- **Neutron monitor network**

Radiation doses (SEP, galactic CR)

- **IPS plus Tomography**

Ground-based observations for Ionosphere-Thermosphere

Needed for **nowcasting** and **post-analysis**

To day operational models used

GIC

Magnetometers

Orbitography

Indices

Magnetic activity (3-h Kp, Dst)

(see **Menvielle and Paris poster**)

Solar activity (daily F10.7)

Telecommunications

TEC or/and Fof2

Ground-based observations for Ionosphere-Thermosphere

- **Recommendation**

Magnetometers

- Upgrading magnetic observatory network(gap above northern Asia and Russia) (60kE)

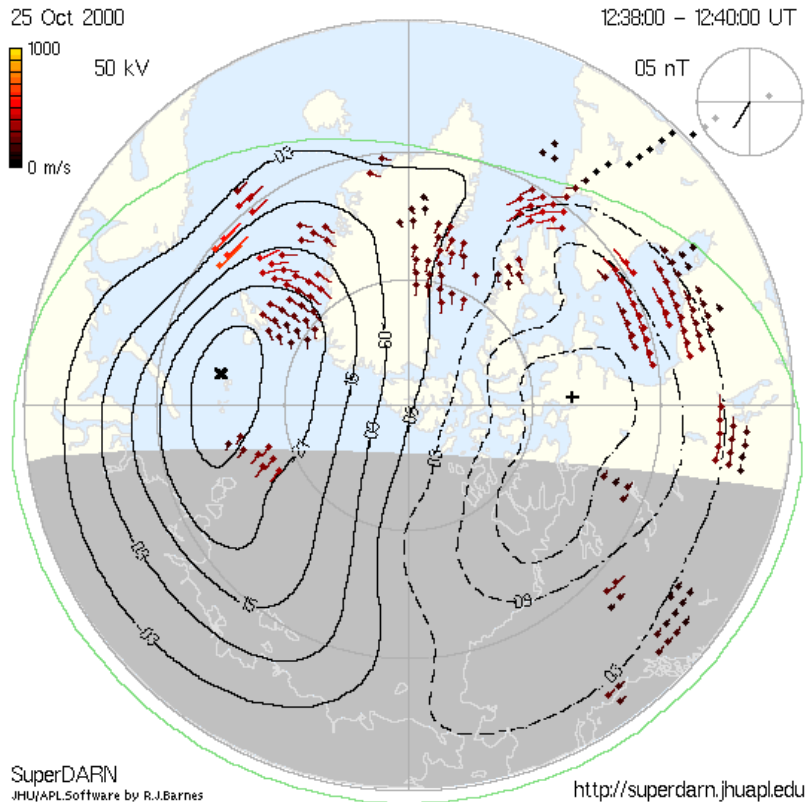
TEC measurements

- Develop analysis of positioning data → TEC -
Future Use GALILEO products

Ionosphere profile measurements

- Upgrade ionosonde network. Recommend SPACE
Upper profile poorly known - Global coverage

Ground-based observations for Ionosphere-Thermosphere



- **Superdarn for Future models**
- **Convection electric field**
- **Recommendation**
 - **Operational 24 h a day**
 - **Develop SW capacity**