

Centre of excellence

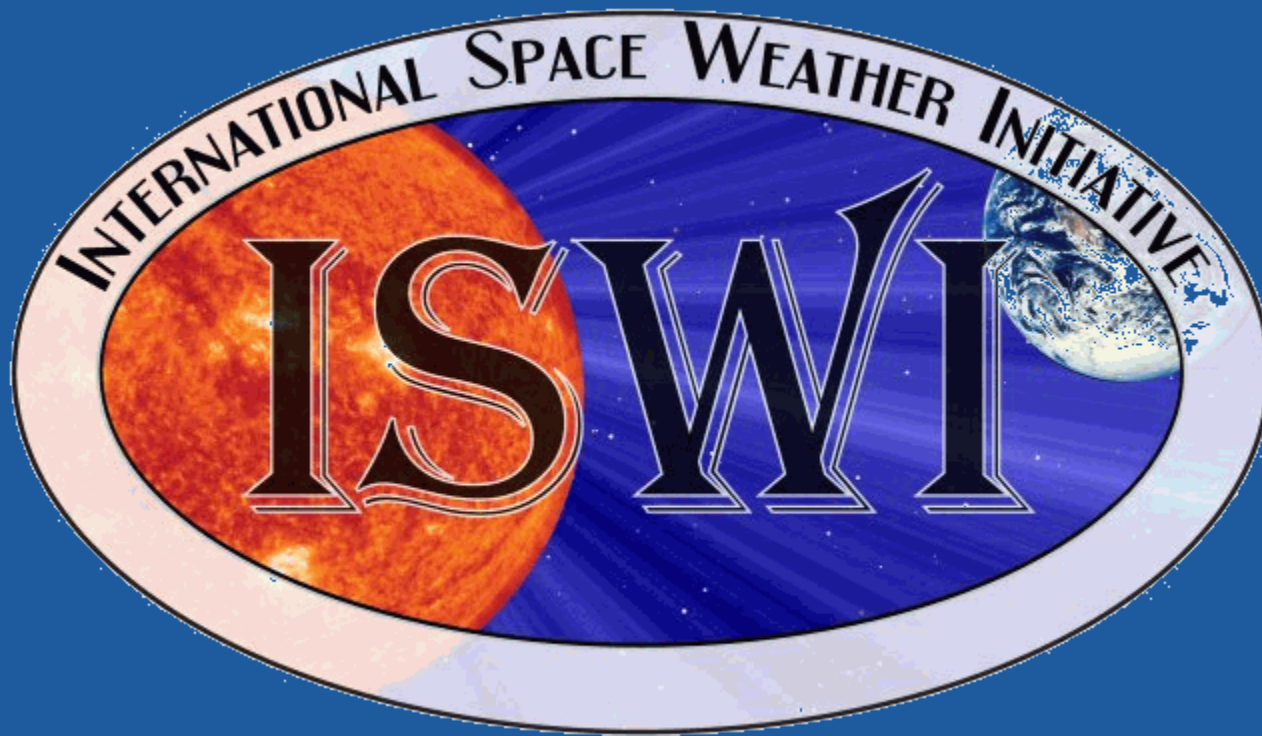
Centre of Space Research: Space Weather Influences

Aleš Kučera

Astronomical Institute of the Slovak Academy of Sciences, Tatranská Lomnica, Slovakia



2011 ISWI - European Summer School in Space Science
August 21-27, 2011, Tatranská Lomnica, Slovakia



ISWI is a program of international cooperation to advance the space weather science by a **combination of instrument deployment, analysis and interpretation of space weather data from the deployed instruments in conjunction with space data, and communicate the results to the public and students.** ISWI is a follow-up activity to the successful IHY 2007, but focusing exclusively on space weather.

The goal of the ISWI is to develop the scientific insight necessary to understand the science, and to reconstruct and forecast near-Earth space weather. This includes instrumentation, data analysis, modeling, education, training, and public outreach.

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Centre of Space Research: Space Weather Influences

The goal

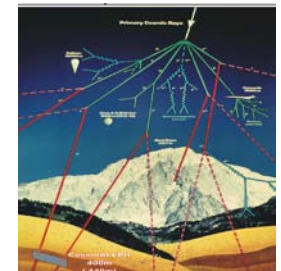
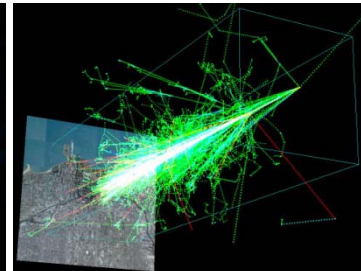
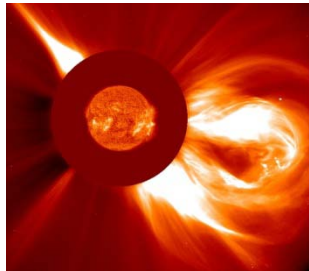
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Project

Contribution by the Structural Funds to real convergence of the Recently Acceded Member States of EU.

Operational Programme:
**Research and Development -
calls in 2008 and 2009**

Approved proposal:
**Centre of excellence "Centre of
space Research: Space Weather
Influences"**



Európska únia
Európske štruktúrne fondy



MINISTERSTVO ŠKOLSTVA
SLOVENSKEJ REPUBLIKY



Agentúra
Ministerstva školstva SR
pre štruktúrne fondy EÚ

ako Riadiaci orgán pre operačný program Výskum a vývoj



udeľuje týmto

**TITUL
CENTRUM EXCELENTNOSTI**

v rámci projektu

**Centrum kozmických výskumov: vplyvy kozmického počasia
pre**

ASTRONOMICKÝ ÚSTAV SAV, Tatranská Lomnica,

ktorý USPEL v rámci OPERAČNÉHO PROGRAMU VÝSKUM A VÝVOJ, výzvy PODPORA CENTIER EXCELENTNOSTI, opatrenia 2.1
PODPORA SIETI EXCELENTNÝCH PRACOVÍSK VÝSKUMU A VÝVOJA AKO PILIEROV ROZVOJA REGIÓNŮ A PODPORA
NADREGIONÁLNEJ SPOLUPRÁCE.



Operačný program
VÝSKUM a VÝVOJ

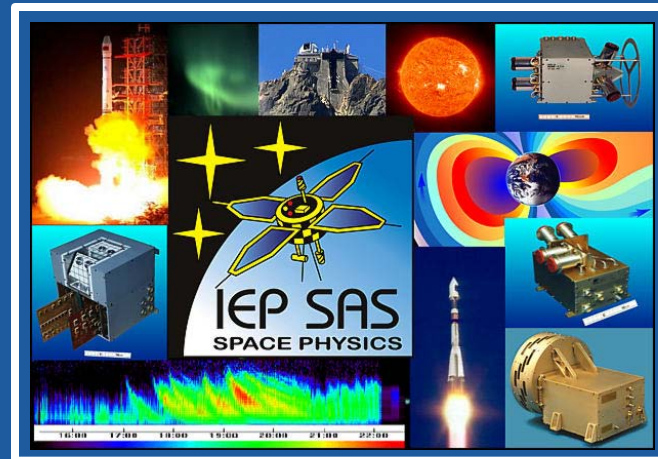

Ján Mikoš
podpredsa vlády a minister školstva SR

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Centre of Space Research: Space Weather Influences

Partners:

Astronomical Institute of the Slovak Academy of Sciences, Tatranská Lomnica



Institute of Experimental Physics of the Slovak Academy of Sciences, Košice



Pavol Jozef Šafárik University, Košice

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Budged:

4 mil €

Two periods

I. 2009-2011 (1.7 mil €)

II. 2010-2013 (2.3 mil €)

Main tasks

- A. An influence of the Sun to the Earth environment
- B. Interaction of the solid component of the interplanetary matter with the Earth's atmosphere
- C. Impact of an energetic particles (neutrons) on the Earth
- D. An improvement of an experimental devices for space projects (satellites)
- E. Communication, teaching, public relations



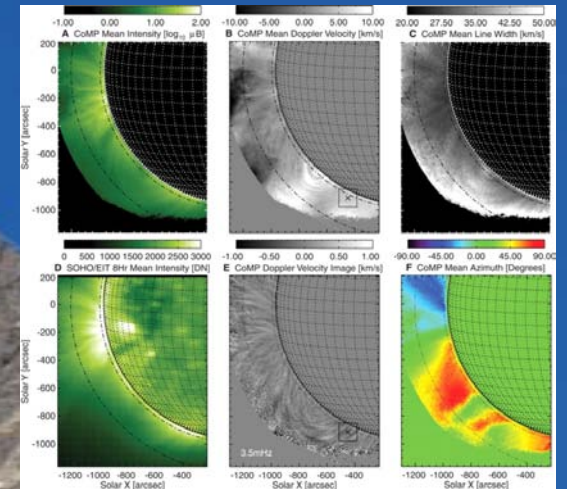
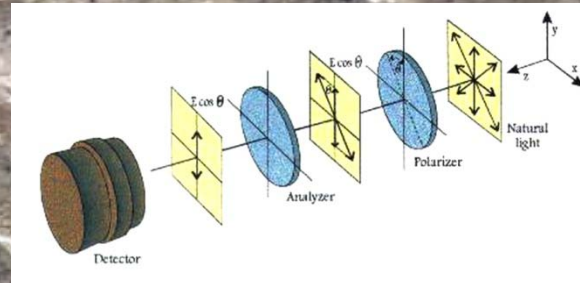
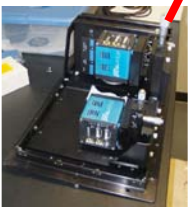
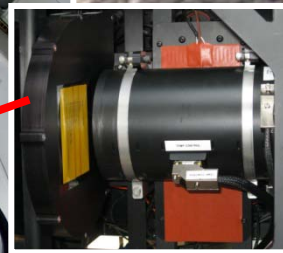
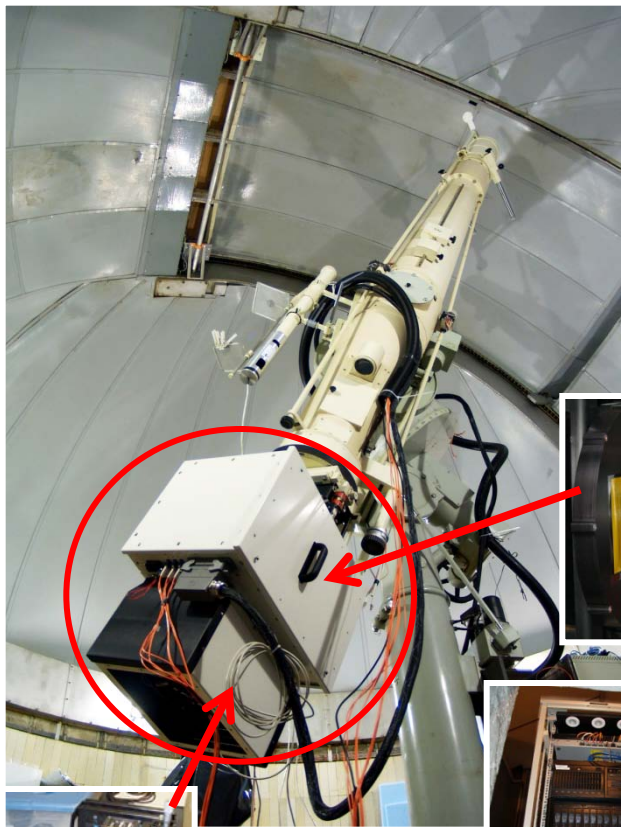
Main tasks

A. An influence of the Sun to the Earth environment

Instrumentation

CoMP - Coronal Multi-channel Polarimeter

Measurements of a **magnetic and velocity fields** in the solar corona



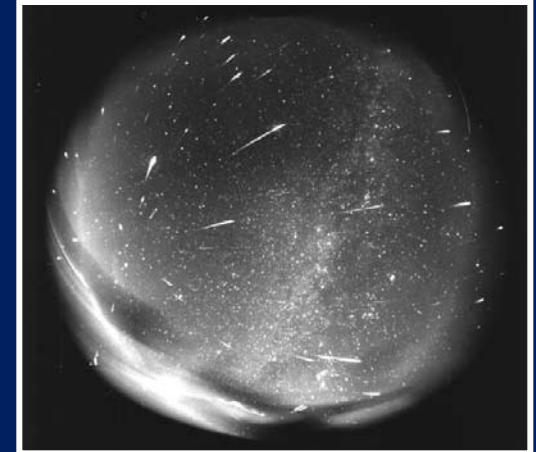
Main tasks

B. Interaction of the solid component of the interplanetary matter with the Earth's atmosphere

Instrumentation

Bolid camera and Double video-cameras,

Precise meteor trajectories, bolids, European bolid network

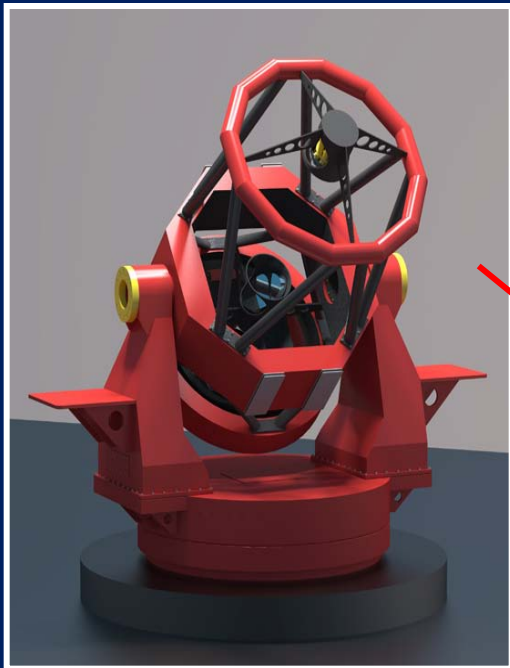


Main tasks

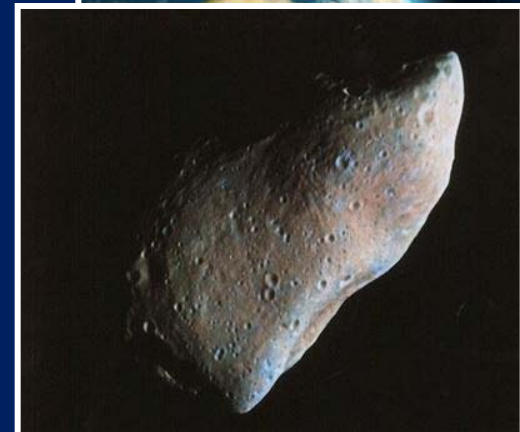
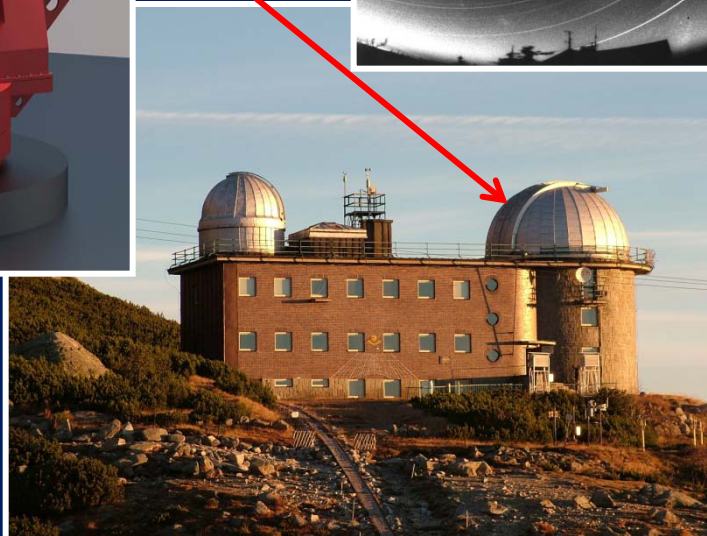
B. Interaction of the solid component of the interplanetary matter with the Earth's atmosphere

Instrumentation

Robotic 1.3 m telescope, Alt-azimuth (ASTELCO)



NEO – Near Earth Objects, collaboration with GAIA



Main tasks

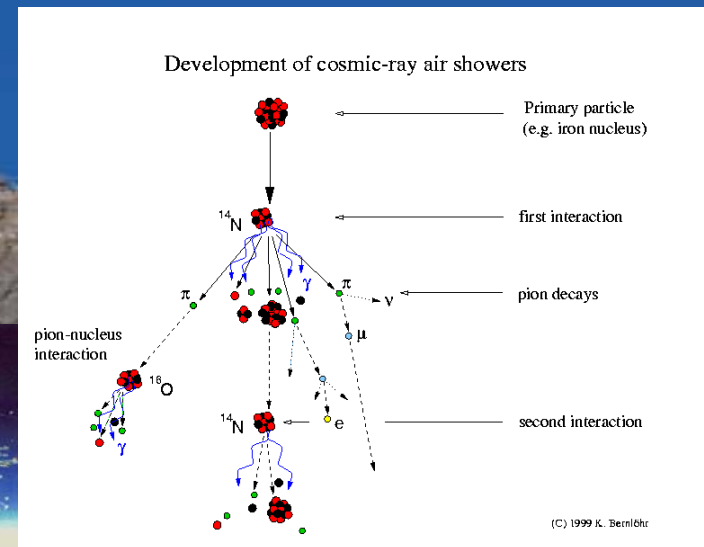
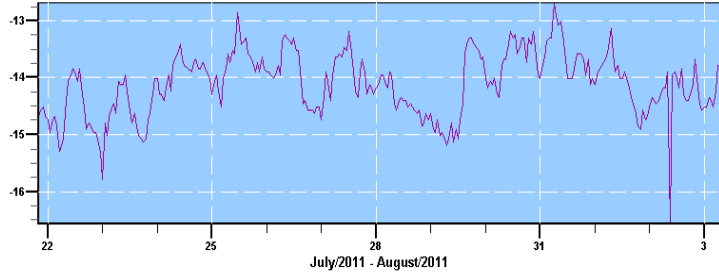
C. Impact of an energetic particles (neutrons) on the Earth

Instrumentation

New neutron monitor at Lomnický peak, Cylindric tubes LND 25373

Secondary cosmic rays measurements - monitoring

Cosmic rays variations(%)



(C) 1999 K. Bernlöhr

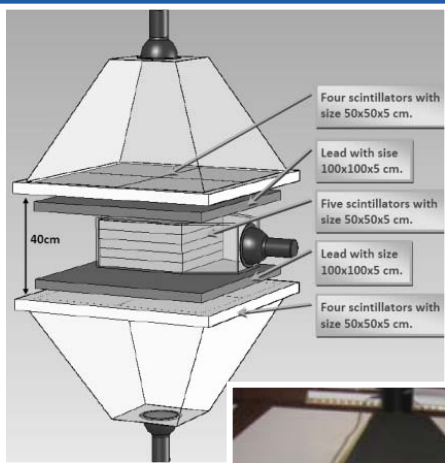
Main tasks

C. Impact of energetic particles (neutrons) on the Earth

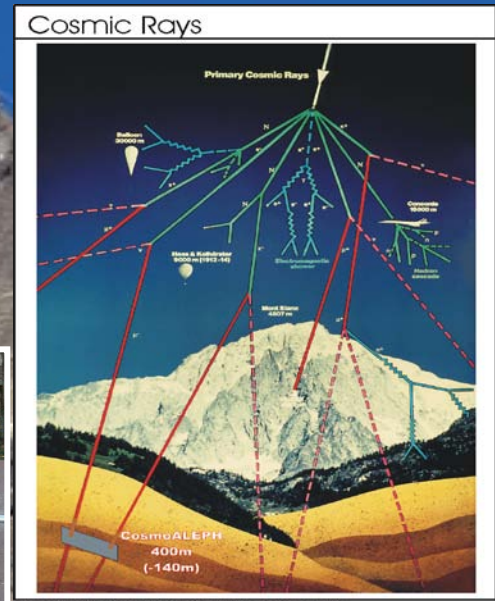
Instrumentation

SEVAN network – particle detectors

and CZELTA - CZEch Large-area Time coincidence Array



New type of particle detectors will simultaneously measure changing fluxes of most species of secondary cosmic rays, thus turning into a powerful integrated device used for exploration of solar modulation effects.



Main tasks

D. An improvement of an experimental devices for space projects (satellites)

Instrumentation

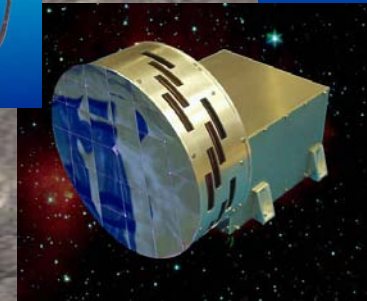
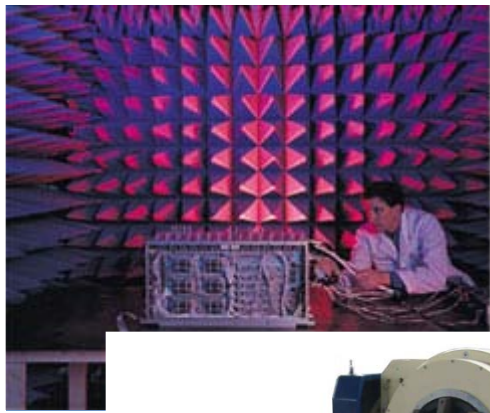
Workplace - tests of electromagnetic compatibility EMC

Workplace of vibration tests

Semiconductor detectors for particle space experiments

Radiation-resistant components for particle space experiments

Construction and manufacturing devices for space missions.



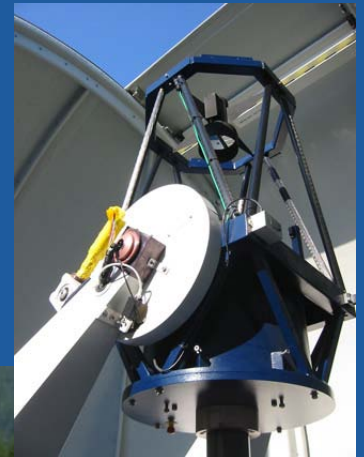
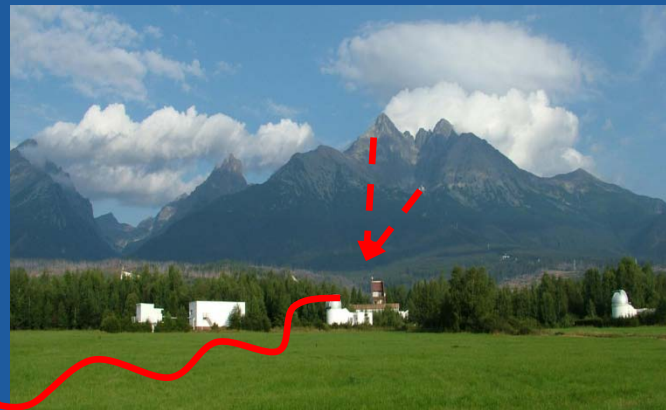
Main tasks

D. Informatics, communication, teaching, public relations

Instrumentation, activities

Improvement of a communications and teaching

- Two computational clusters, servers, software,
- Fast radio-connection to Lomnický peak and Skalnaté pleso observatories
- Videoconference system
- 50 cm teaching telescope (University Košice)



Main tasks

D. Informatics, communication, teaching, public relations



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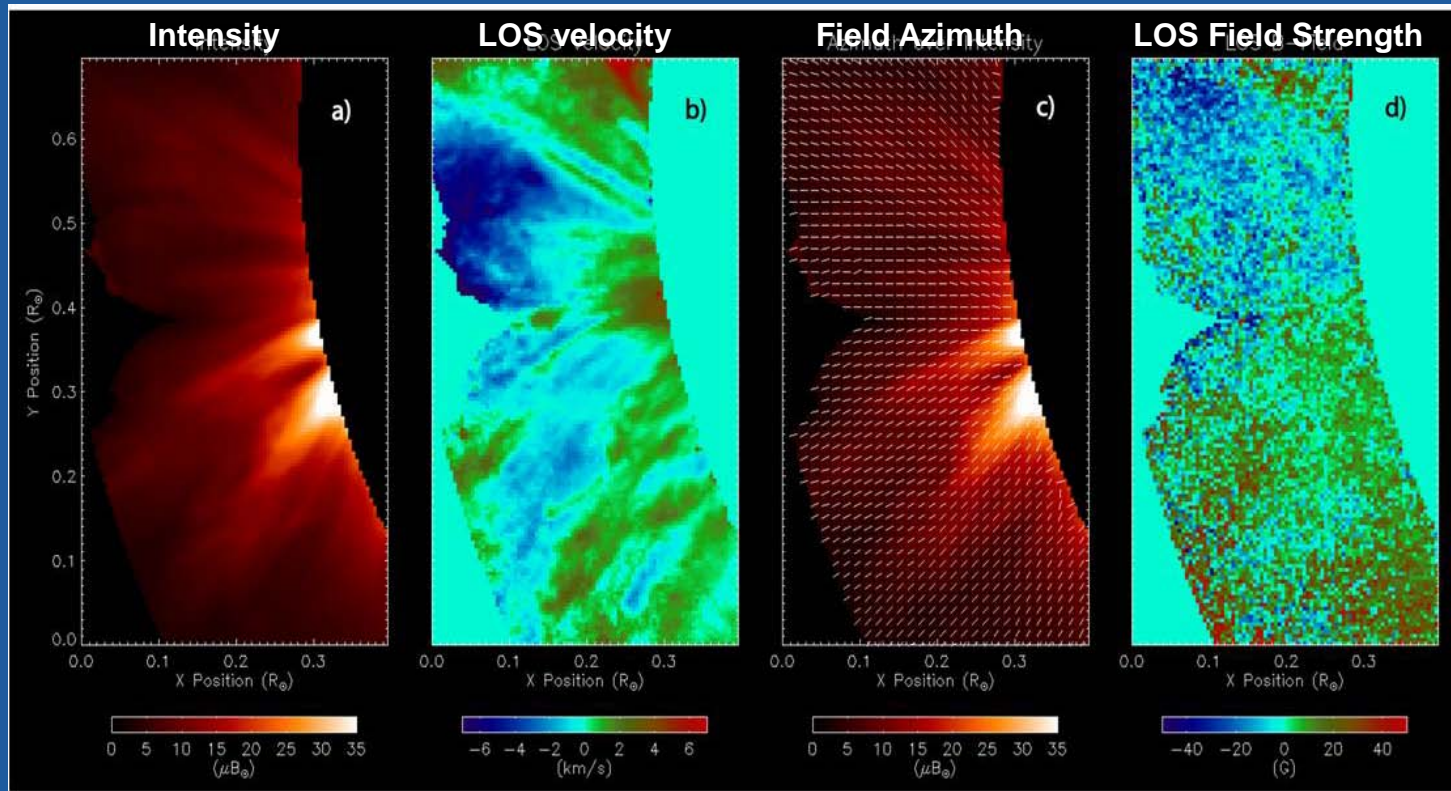
Thank you



2) New instrument for Lomnický peak: CoMP-S

c) technical parameters

Original Coronal Multi-channel Polarimeter (CoMP)



CoMP/Hilltop, Sac Peak Observatory (USA) - FeXIII 1074.7nm line, Oct 31, 2005.

3) Planned observations

COOPERATION

High Altitude Observatory, National Center for Atmospheric Research,
Boulder, USA

Lomnicky Peak

Longitude: 20.22° E

Latitude: 49.20° N

Altitude: 2632



Mauna Loa

Longitude: 155.58° W

Latitude: 19.54° N

Altitude: 3414



Note that Longitude Difference is 175.80° which offers the possibility of coordinated observing