

International Meridian Circle Program - Europe Africa Pacific

Connecting Space Weather over Europe, Africa and the Pacific
along the 30° E - 150° W Great Meridian Circle

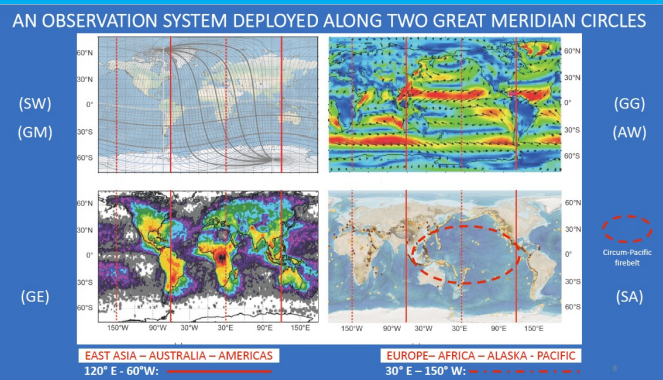
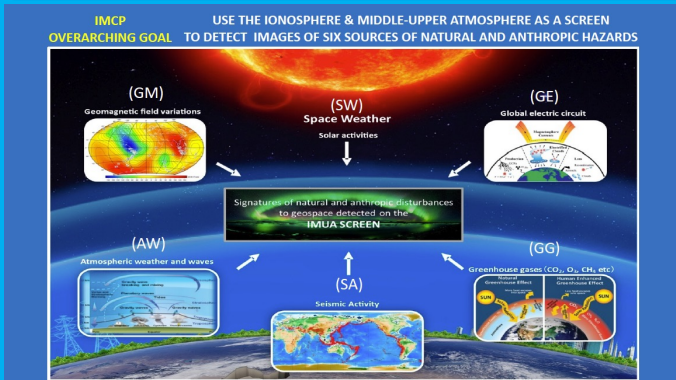


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FROM SCIENCE OBJECTIVES TO OBSERVATION SYSTEM



TWO GREAT CIRCLES TO MONITOR SPACE WEATHER

SYNERGIES WITH SPACE OBSERVATIONS

Operating together for a period of SEVERAL DECADES

→ Continuous coverage during and between consecutive space missions

The two Great Circles offer comprehensive coverage of geographic and geomagnetic latitudes at FOUR LONGITUDES 90° APART

Fully complementary to polar orbiting satellites which usually provide good coverage of latitudes/longitudes at a fixed local time

Broader coverage of altitudes (sometimes 3-D) with a diversity of space sampling characteristics

EUROPE-AFRICA-PACIFIC GREAT MERIDIAN CIRCLE #2

In complement to Meridian Circle #1:

- All local times covered in 6 hours
- Captures land-ocean contrasts and world maximum of thunderstorm activity
- Longest continental traverse of equatorial electrojet
- Specific coverage of "Ocean Hemisphere"

EAST ASIA - AUSTRALIA - AMERICAS GREAT MERIDIAN CIRCLE #1

Thanks to Earth's rotation, All local times covered in 12 hours

- Fully covers magnetic AND geographic latitudes
- Manages continental coverage
- Fair coverage of circum-pacific fire belt to study/monitor earthquake effects

Inspired by the Chinese Meridian Project Logical Scheme and geographic coverage

Chinese Meridian Project

IMCP

中国子午线观测计划

IMCP is a "Template" for IMCP: Covers the full Solar-Terrestrial chain. These networks geographic locations, altitudes, time bases, data rates, systems, and latitudes, low latitudes, Tibetan plateau.

BUILDING THE IMCP : THE WAY FORWARD

TWO GREAT CIRCLES, FOUR PILLARS

- 1 - INSTRUMENTS & NETWORKS**
Monitor the Solar-Terrestrial chain & the "IMUA Screen"
- 2 - SCIENCE**
FORMULATE SCIENTIFIC QUESTIONS & ADDRESS USERS NEEDS
- 3 - DATA**
On-line repositories Accessible to MCP users
- 4 - INTERNATIONAL COLLABORATION**
On-line tools & International Teams

NEW SCIENTIFIC INSIGHTS
NEW MONITORING CAPACITIES
NEW FORECASTING METHODS

Virtuous circle of knowledge building

SYNERGIES OBSERVING BASED, SPACE, INNOVATION, KNOWLEDGE, ALL TOOLS

TAKE AWAY MESSAGES

We invite the PNST community and INSU to

- Contribute to the IMCP-EAP ground-based instruments network:
- Develop interdisciplinary connections to study the impacts of:
 - Solar-Terrestrial connections
 - Tropospheric weather, atmospheric electricity and climate change
 - Secular variations of the geomagnetic field
 - Solid Earth disturbances : earthquakes, tsunamis, volcanic eruptions,...

on the Upper Atmosphere

- Propose an ambitious French and European contribution to IMCP

THE WAY FORWARD

- IMCP Europe-Africa-Pacific Working Group agenda for 2024
 - Involve ISWI national representatives
 - Address the key science objectives (topical WG's);
 - Inventory of Observation System equipments: existing, to be renovated, new needs
 - Concrete steps forward on Data Access and Collaborative projects
- IMCP-EAP International meetings 2024;
- IMCP Europe-Africa-Pacific Circle Workshop #1
- Participation to IMCP Workshop 2024 (Sao Paulo, Brazil, Sept. 23-27, 2024)

G/B INSTRUMENTS FOR EUROPE, AFRICA AND THE PACIFIC

EUROPE-AFRICA-PACIFIC: Large and Medium-Scale Instruments

ARCHITECTURE OF IMCP OBSERVATION SYSTEM

"STAND-ALONE" INSTRUMENTS

Large facilities
- RAs
- LIDARs
- Radiobalographs

Medium-scale facilities
- HF radars
- Digisondes
- FP spectrometers
- Airglow imagers

Each instrument brings a piece of the puzzle of upper atmosphere forcing from above and from below!

More effective monitoring of natural hazards achieved through data sharing and collaborative research

A collaboration between all nations that will benefit to all nations

EUROPE-AFRICA-PACIFIC: Network Instruments

Network Instruments
Ionosondes
Magnetometers
GNSS stations

Regional
- European
- African
- Asian

Latitudinal
- High
- Mid
- Low

World wide

