



Chinese Space Weather Program for the Next Five Years

Xueshang Feng

State Key Lab for Space Weather

Outline:

Ground-based and Space-based Plan

**Research Plan by National Natural Science Foundation
of China**

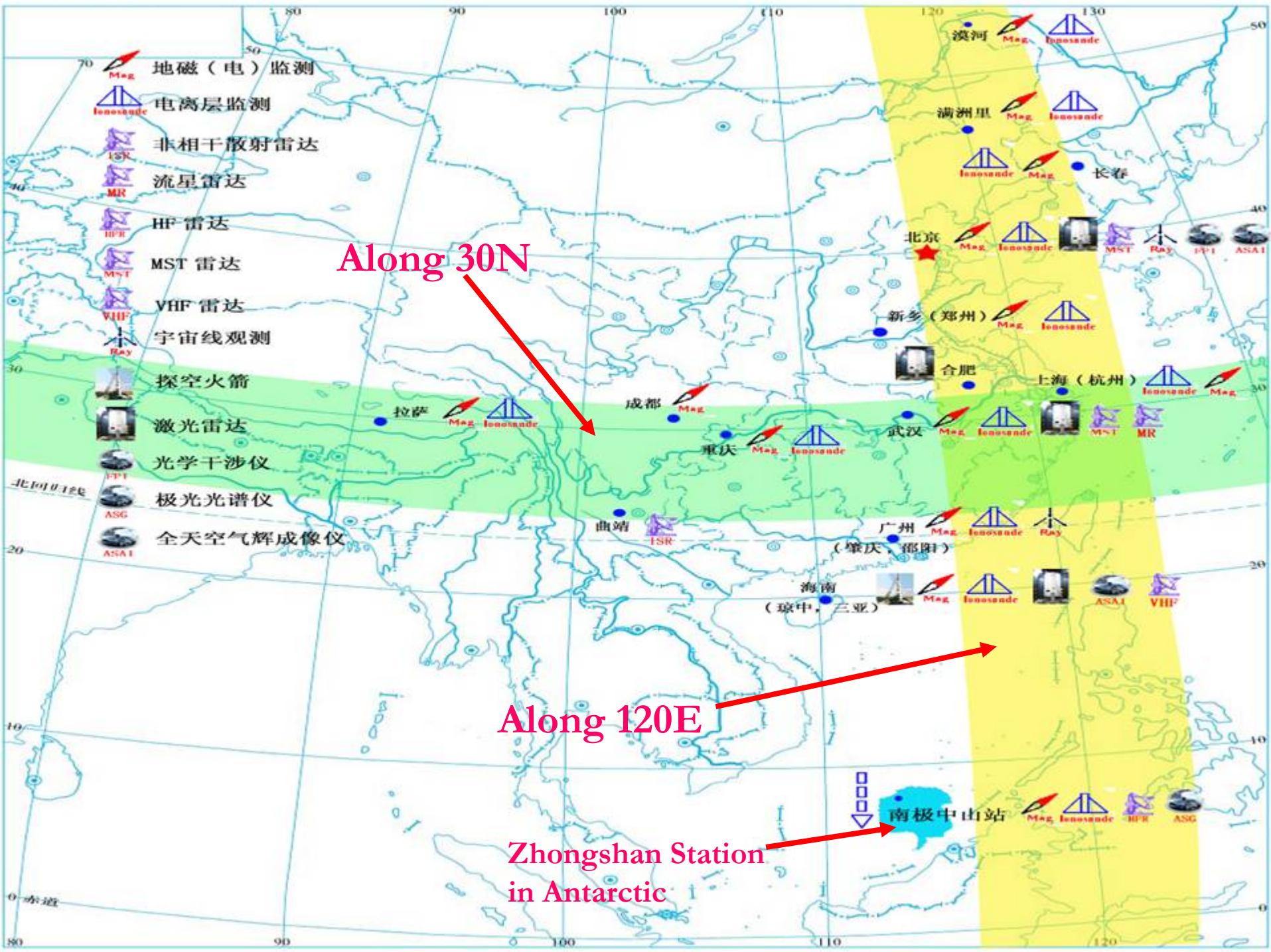


Meridian Project

It is a Chinese multi-station chain along 120°E to monitor space environment, starting from Mohe (the most northern station in China), through Manzhouli--Harbin--Changchun--Beijing--Xinxiang--Wuhan---Guangzhou and extended to Chinese Zhongshan station in the Antarctic.

Meanwhile, the north-latitude 30°N station chain from Shanghai at the eastern China through Wuhan, Chengdu to Lasa (Tibet) station at the western China will bring into full play in this monitoring system.





Meridian Project Framework



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The frame of the Meridian project consists of three systems as follows:

(1) Space environment monitor system

- Radio monitor subsystem
- Geomagnetic (Goelectronic)-monitor subsystem
- Optical-atmospheric monitor subsystem
- Hainan ground-based comprehensive observatory





(2) Data and communication system

- Collect, transfer, process, store and distribute data
- International data exchange
- Coordinating stations, instruments and operating

(3) Research & Modeling and forecast system

- Coordinating observations, research and management
- Carrying out research
- Jointly forecasting space weather
- Promoting international cooperation





Incoherent scatter radar to
be reformed

25M antenna



位于云南曲靖的直径25米的雷达天线及伺服齿轮

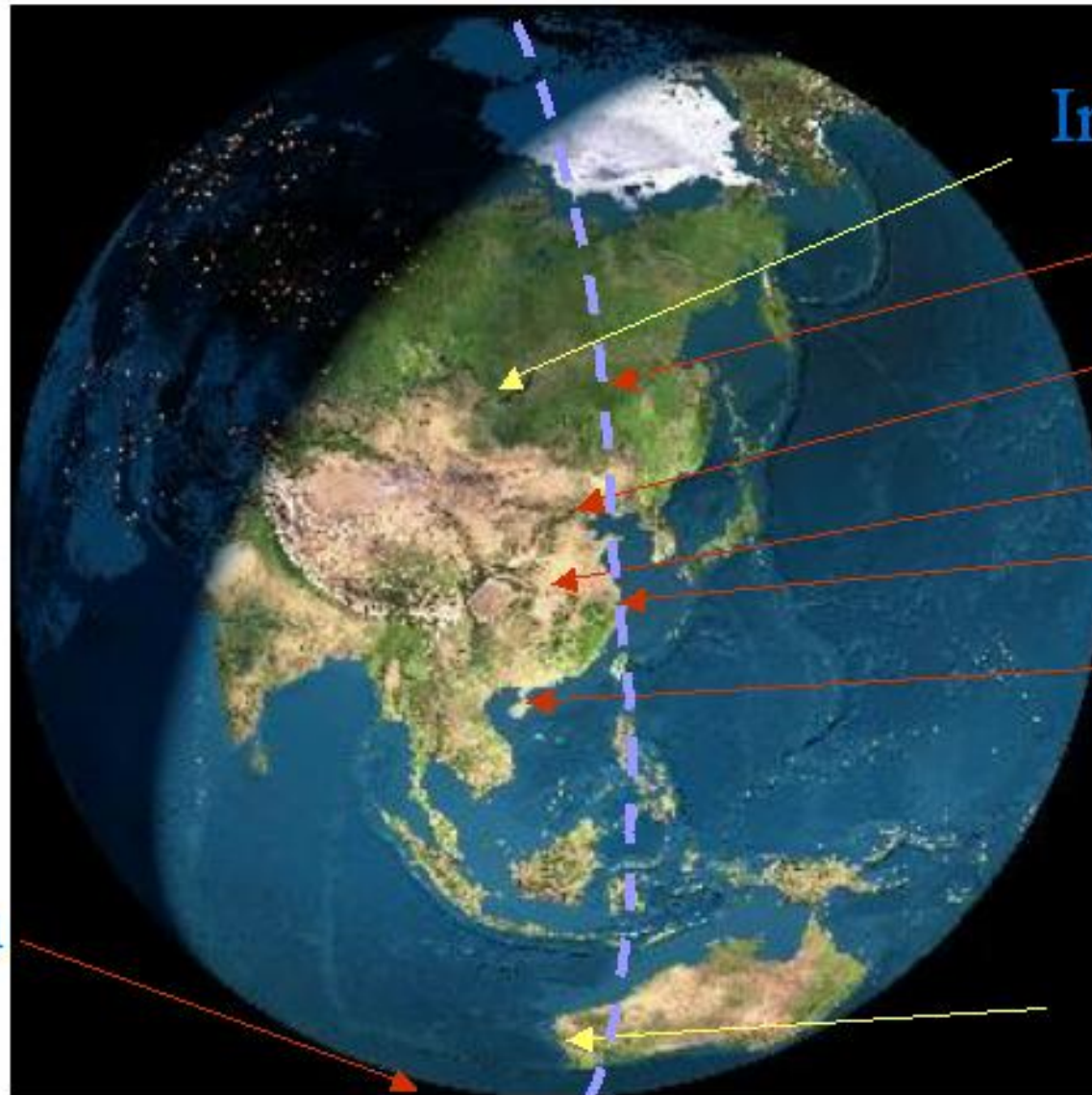




Accompanying the Meridian project, Chinese Scientists suggested an International Space Weather Meridian Circle Program (ISWMCP) to establish complete meridian circle connecting 120°E and 60°W meridian chains in order to enhance the ability of space environment monitor.

To promote international cooperation between 120°E and 60°W meridian chains by means of organizing and conducting an “International Space Weather meridian circle program” (ISWMCP).





Irkutsk

Mohe

Beijing

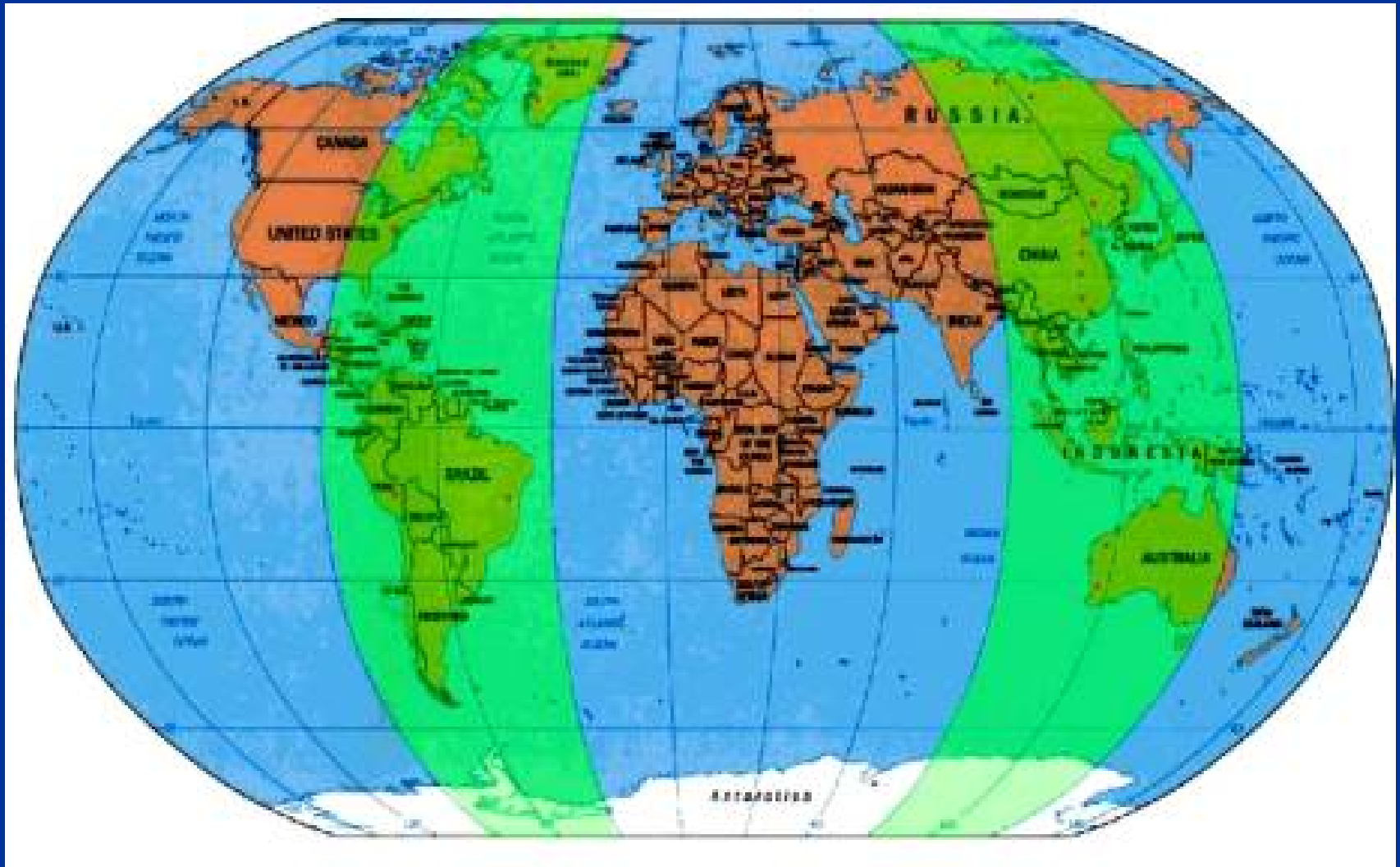
Wuhan

Shanghai

Hainan

Zhongshan

Australia





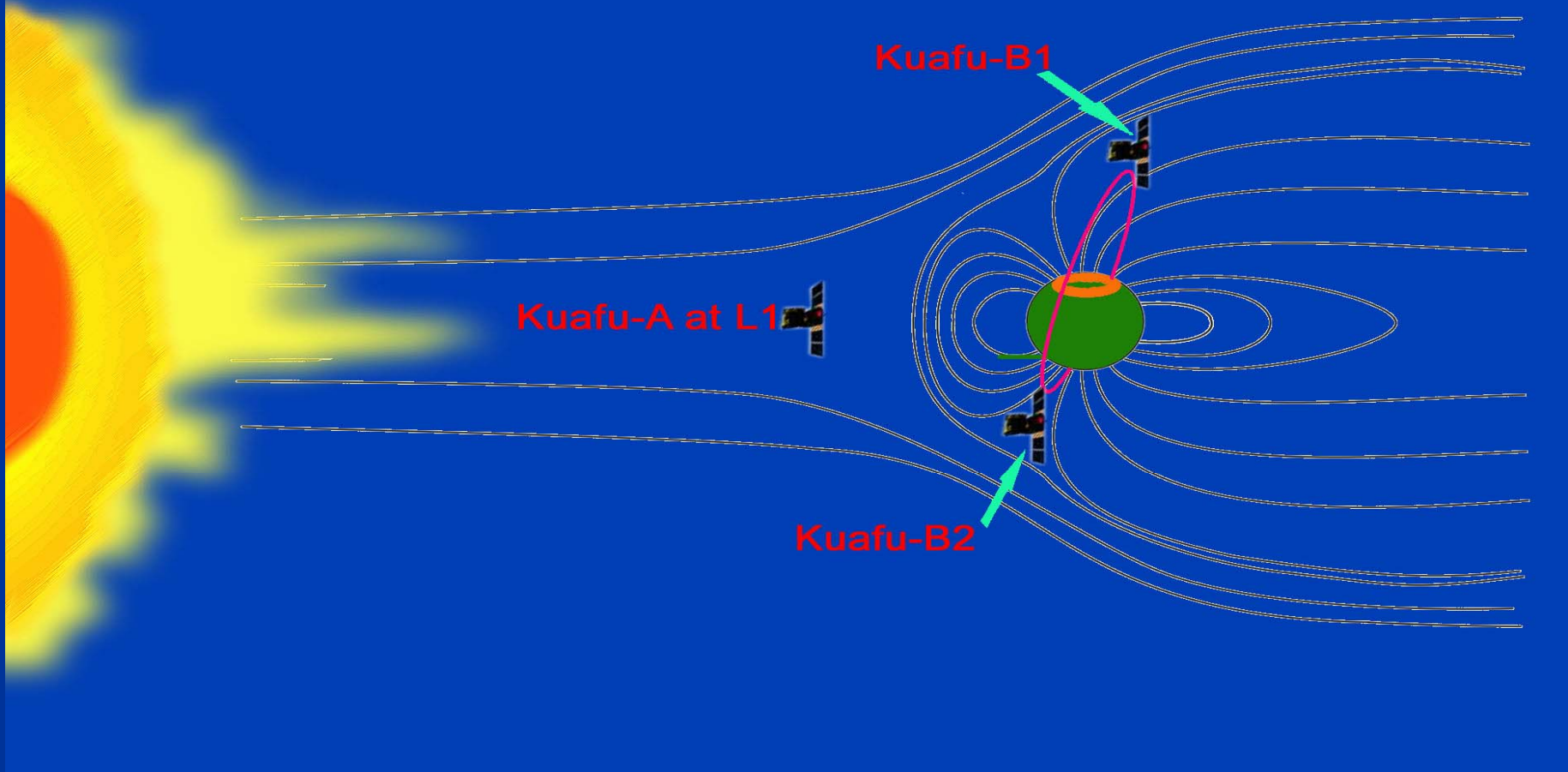
KuaFu Project



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Three Statellites(1 L1 2 Polar orbit Statellites)

To be launched in 2012



Engineering Group

Yong-Wei Zhang DFH Satellite Co. LTD (Chief)

Shi-Geng Yuan DFH Satellite Co. LTD (System Engineer)



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KuaFu A Group

L.-D. Xia	University of Science and Technology of China (Convener)
R. Schwenn	Max Planck Institute for Solar System Research, Germany
E. Marsch	Max Planck Institute for Solar System Research, Germany
P. Rochus	University of Liege, Belgium
P. Lamy	Laboratoire d'Astrphysique de Marseille, France
J.-L. Bougeret	Centre National de la Recherche Scientifique, France
U. Schühle	Max Planck Institute for Solar System Research, Germany
R. Wimmer-Schweingruber	Kiel University, Germany
K.-H. Glassmeier	Braunschweig University, Germany
C. M. Carr	Imperial College London, United Kingdom
W.-Q. Gan	Chinese Academy of Sciences, China
J. Chang	Chinese Academy of Sciences, China
S.-J. Wang	Chinese Academy of Sciences, China





KuaFu-B Group

Jing-Song Wang

Peking University, China (Convener)

E. Donovan

University of Calgary, Canada

Trond S. Trondsen

University of Calgary, Canada

M. Lester

Leicester University, United Kingdom

T. -L. Zhang

Austrian Academy of Sciences, Austria

S. McKenna-Lawlor

National University of Ireland, Ireland

M. Dunlop

Rutherford Appleton Laboratory, United Kingdom

C. Jamar

University of Liege, Belgium

S.-Y. Fu

Peking University, China

H.-F. Chen

Peking University, China

L. Xie

Peking University, China

J. Wu

China Research Institute of Radiowave Propagation, China

D.-H. Zhang

Peking University, China



Payload of KuaFu-A (updated in Jan. 2006)



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Instrument	Mass (kg)	
EUV/FUV disk imager (EDI), including a Lyman-alpha disk imager Polarimeter	25 2	P. Rochus (□□□) U. Schühle □□□□
Coronal Dynamics Imager (CDI), including a Lyman-alpha coronagraph	45	P. Lamy □□□□
Radio Burst Instrument (RBI)	11	J.-L. Bougeret □□□□
Solar Wind Instrument Package (SWIP) Boom	6 7	R. Schwenn □□□□ K.-H. Glassmeier □□□□ C.M. Carr □□□□
Solar Energetic Particle Sensor (SEPS)	6.5	R. Wimmer-Schweingruber □□□□ S.-J. Wang □□□□
Hard X-Ray and Gamma-Ray Spectrometer (HXGR)	4.5	G.-W. Qun □□□□ J. Chang
Solar Irradiance Measurement (SIM)	13	D.-R. Lü □□□□ W. Schmutz □□□□
Multi-Order Solar EUV Spectrograph (MOSES)	10	L. Harra □□□□
Total	130	



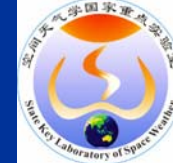


Payload of KuaFu-A

Instrument	Power (W)	Data rate (kbps)	Size (L×W×H)
EDI	20	100	600×180×150 mm ³ 600×300×200 mm ³
CDI	35+38	100	1200×160×160 mm ³ 620×320×100 mm ³
RBI	10	4	About 5 modules A4
SWIP	6	4	n/a
SEPS	10	1	n/a
HXGR	5	1	150×100×100 mm ³
SIM	8	<2	Φ 200 mm×250 mm +270×224×150 mm ³
MOSES	11		600x 350x100 mm ³
Total	132	212+[]	



KuaFu B Payload



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仪器名称	质量(kg)	功率(W)	所属国家	负责人
紫外成像仪 (UVAMC)	21	11	Canada	E. Donovan T. S. Trondsen
太阳风离子分析仪 (FUVSI)	20	4.4	Belgium	C. Jamar
太阳风分析仪 (WFAI)	1.5	10	UK	M. Lester
太阳风磁通计 (FGM)	3	4.25	Austria	T.-L. Zhang
高能粒子探测器 (HECPE)	3	4	China	张松
离子电子谱仪 (IEPS)	5.6	4.5	UK	M. Dunlop
太阳风分析仪 (NAIK)	6	4	Ireland	S. McKenna- Lawlor
高能粒子探测器 (FPI)	6	10	UK	A. Fazakerley
离子磁通计 (IMS)	3.5	2.5	France	H. Reme
太阳风磁通计 (TBB)	3.5	1	China	张松
Total	73KG	~56W		



Space Weather Research Program



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The seven key topics are proposed and will be supported by National Natural Science Foundation of China in the period of the tenth five-year plan(2005-2010) of China.

- Solar Driver of Space Weather
- Interplanetary Weather Process
- Plasma physical Problems in Space weather
- Integrated modeling and method
- The influence of space weather on human activities such as communication
- New explorative principles & methods

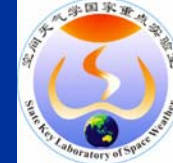




Scientific Objectives

- Construct a theoretical framework for space weather linkage process in the solar-terrestrial system;
- Establish a cause-effect integrated model and a comprehensive prediction method of space weather event to improve prediction capability;
- Open up study of damage mechanism and protection that are caused by space weather in formation, material and other scientific areas to provide a scientific base.
- Propose new conception for space weather satellite series and develop new exploration principles and methods to provide new base for making original progress in understanding space weather.





Space Weather Research Plan

Exploration

New Conceptions
&
New Principles

New conception
for space weather
satellite series

New explorative
principles &
methods

Research

Scientific frontier

Solar
drive
sources

Plasma
Basic
theory

Interplanetary
weather

Integrated
Forecasting
model &
Method

Geospace
weather

Application

Human Activity

Influence to information
system

Influence to space life

Influence to space material

Cause-effect Chain model
& comprehensive
prediction method





Other Space Weather Activities

- Some major programs such as “Adverse Disturbance Process in the Solar-Terrestrial Space and its Influence on Human Activities”, (1999-2003), “Multiple temporal Physical Process of geospace storms”, (2004-2009) ---supported by National Natural Science Foundation of China
- A follow-up symposium on space weather is going on from 1997
- A foundation of space weather will be set up for international corporation

Thanks

