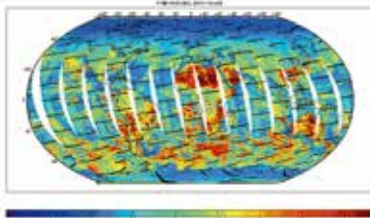


Research Group of New Generation Space-Borne Optical Payloads with High Accuracy for Atmospheric Exploration Shanghai Institute of Technical Physics, Chinese Academy of Sciences



风云四号卫星干涉式大气垂直探测仪和扫描辐射成像仪
Geosynchronous Interferometric Infrared Sounder (GIIRS) and Advanced Geosynchronous Radiation Imager (AGRI) on-board FY-4 Satellite



ERM全波段辐射图
Total Wave Radiance Image from Earth Radiation Measurement Unit

Aiming at the commanding heights of international remote sensing competition, this research group has been focused on the strategic requirements from the meteorological domain and atmospheric probing. By breaking through key technology of three-dimensional atmospheric optical sensing with high accuracy, they complete the design and fabrication of almost all space-borne main optical payloads for meteorological detection successfully. A technical system for developing optical payloads of meteorological satellites has been established. The group developed GIIRS, which is the first high spectral sounder ever flown in geostationary orbit, with the spectral resolution of 0.625cm⁻¹. The rapid observing hyper-spectral atmospheric sounding technology with high accuracy fills the gap in three-dimension fine remote sensing. The international meteorological community is eager to use this new type of data GIIRS gained. This group has accomplished significant contributions in upgrading and updating national atmospheric probing technology, and exceeding the international level progressively. The technology will play an irreplaceable role on atmospheric frontier sciences.

Outstanding contributors of this research group

Ding Lei

As the team leader of the research group, he focused on system frame work research, and accomplished payloads including spectral imager, interferometric sounder, infrared radiometer. He leads the group making great breakthrough in the technology of meteorological sensors.

Hua Jianwen

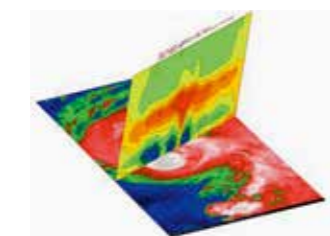
He broke through the critical technology of interferometer working in space, established the technical system on designing and fabrication of infrared interferometer. He applies the infrared hyper-spectral technology on meteorological satellites.

Yin Dekui

He developed the technology of polarization imaging with large field of view, and applied the technology on atmospheric probing. He made breakthrough of three-dimension probing for low orbit meteorological satellites.



风云三号卫星红外分光计
InfraRed Atmospheric Sounder (IRAS) on-board FY-3 satellite



红外分光计获取的台风三维大气温度廓线
Three-dimensional Atmospheric temperature profile of Typhoon from IRAS



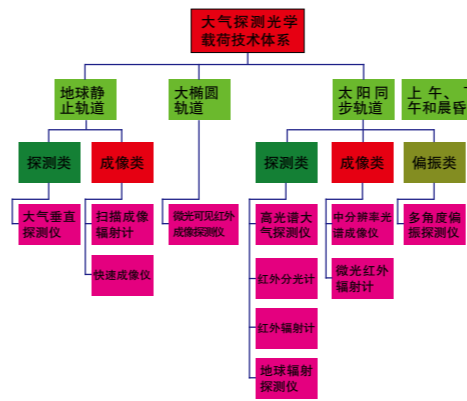
风云三号卫星中分辨率光谱成像仪
MEdium Resolution Spectral Imager (MERSI) on-board FY-3 satellite



中分辨率光谱成像仪获取的全球影像镶嵌图
Global Image Mosaic from MERSI of FY-3 satellite



研究集体主要成员
Members of the Research Group



新一代星载高精度大气探测光学载荷技术研究集体

推荐单位：中国科学院上海技术物理研究所

研究集体主要科技贡献：

该研究集体紧密围绕气象领域和我国大气探测的战略需求，瞄准国际竞争的制高点，通过高精度三维光学探测等诸多关键技术的突破，完成了我国全部在轨成功应用的气象探测光学主载荷研制，建立了我国军民气象卫星光学载荷的技术体系。发展并应用中国特色方案，研制了世界上首台运行于 36000km 轨道高度、光谱分辨率达到 0.625cm⁻¹ (-1 请确实是上标) 的干涉式大气垂直探测仪，国际上率先实现了高时效、高精度、高光谱大气垂直探测，填补了静止轨道三维精细遥感的空白，处于国际领跑。该集体的研究成果为我国大气探测技术实现升级换代和逐步超越国际水平做出了重要贡献，将在大气科学前沿问题探索中发挥不可替代的作用。

大气探测光学载荷技术体系
Technical system of space borne optical payloads for atmospheric sensing

研究集体突出贡献者



丁雷 Ding Lei

丁雷 中国科学院上海技术物理研究所

主要科技贡献：学科带头人，负责系统技术方案研究，主持研发光谱成像仪、垂直探测仪、红外辐射计等载荷，带领团队突破气象载荷关键技术。



华建文 Hua Jianwen

华建文 中国科学院上海技术物理研究所

主要科技贡献：突破空间应用的干涉仪技术，构建了红外干涉仪技术体系，完成红外高光谱技术在气象卫星载荷上的应用。



殷德奎 Yin Dekui

殷德奎 中国科学院上海技术物理研究所

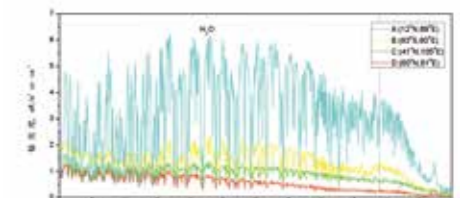
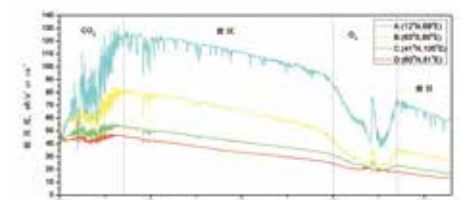
主要科技贡献：突破大视场偏振成像技术，成功实现偏振成像技术在大气探测中的应用，实现在低轨气象卫星平台的大气三维探测能力突破。

研究集体主要完成者

丁雷 华建文 殷德奎 王向华 钮新华 王淦泉 柴金广 洪孝炬 董德平 陈永平 李向阳 吴亦农 袁杰 韩昌佩 刘云猛 王妮丽 袁红辉 李利兵 沈霞 祁公祺

技术性能	FY-4A	GOES-R	Himawari-8
发射时间	中国: 2016/12/11	美国: 2016/11/18	日本: 2014/11/11
轨道高度	35785km	35785km	35785km
轨道倾角	0°	0°	0°
扫描幅宽	141°	141°	141°
扫描速率	1.5°/s	1.5°/s	1.5°/s
光谱分辨率	0.625cm ⁻¹	0.625cm ⁻¹	0.625cm ⁻¹
探测通道	24	24	24
探测精度	±1%	±1%	±1%
探测灵敏度	0.01K	0.01K	0.01K
探测分辨率	370m	370m	370m
探测波段	0.6-14μm	0.6-14μm	0.6-14μm
探测能力	全球覆盖	全球覆盖	全球覆盖

风四性能同类卫星对比
Comparison for the state of art geostationary meteorological satellites



大气垂直探测仪获取的大气光谱图
Atmospheric spectrum from GIIRS