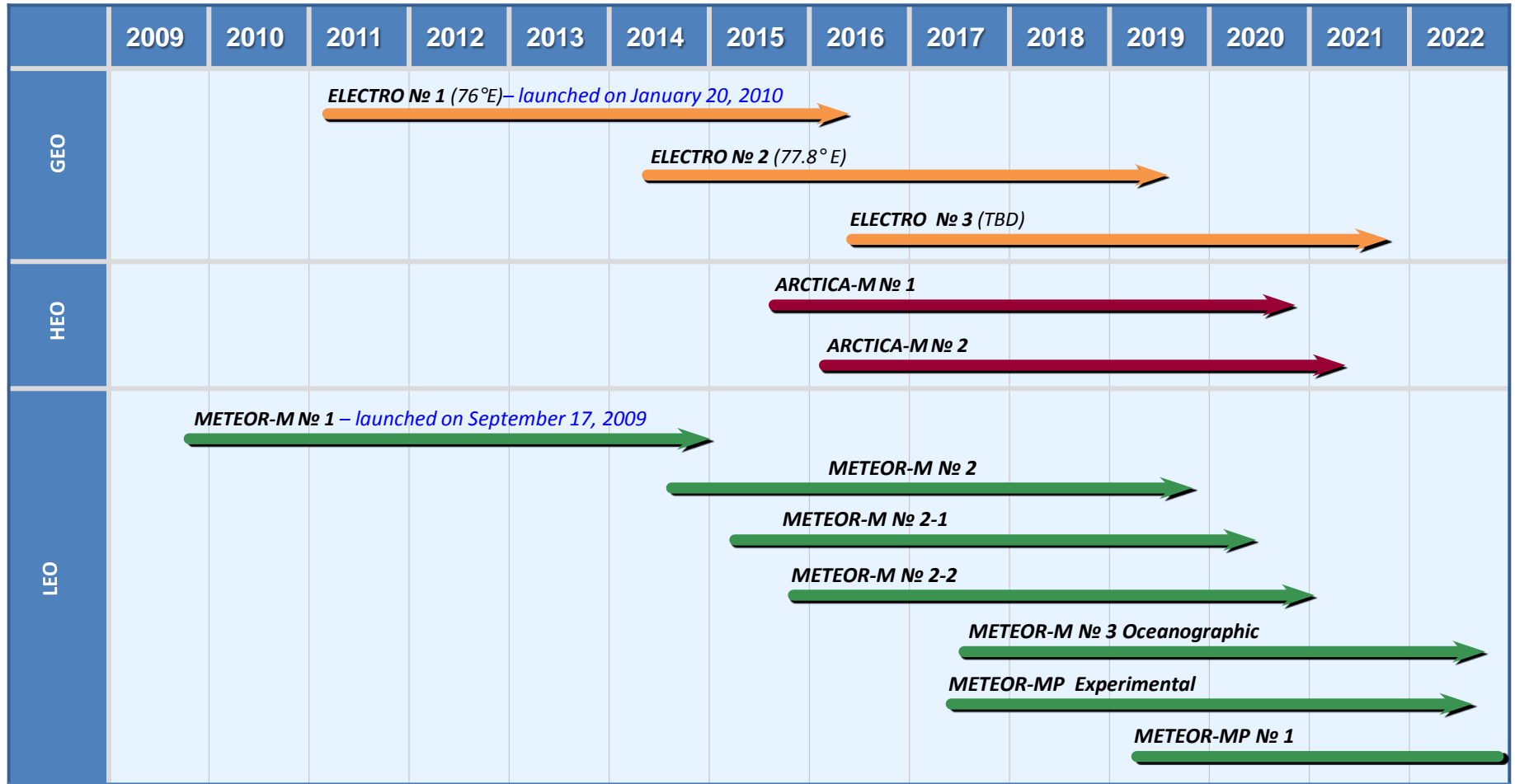
A satellite view of Earth showing a large cyclone over the Indian Ocean. The moon is visible in the upper left corner. The text "Russian Meteorological Satellite Systems" is overlaid in orange.

Russian Meteorological Satellite Systems

**Presented at ITSC-19, March 2014
SRC PLANETA, Roshydromet**

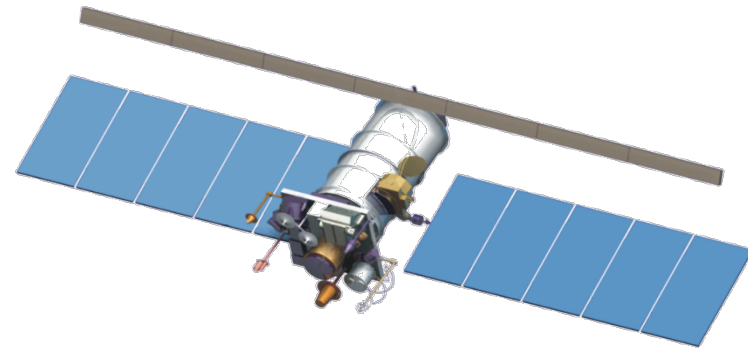
Planning of Russian Meteorological Satellite Systems



METEOR-M General Design



Russian meteorological satellite Meteor-M №1 was launched on ***September, 17th 2009***



In-orbit mass – 2700 kg

Payload mass – 1200 kg

Lifetime – 5 years

Orbit – Sun-synchronous

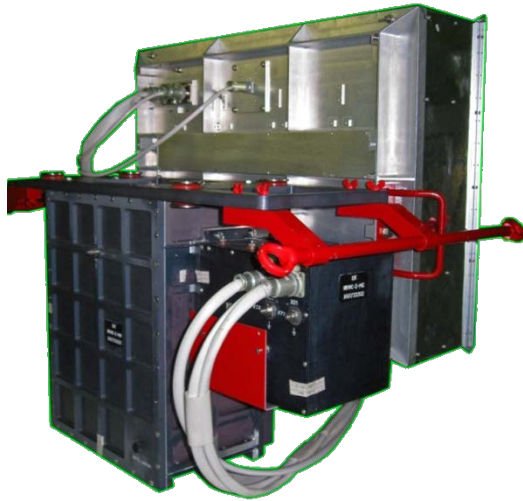
Altitude – 830 km

Data dissemination format – HRPT/LRPT

Meteor-M № 2, 2-1, 2-2 Basic Instruments Specifications

<i>Instrument</i>	<i>Application</i>	<i>Spectral band</i>	<i>Swath-width (km)</i>	<i>Resolution (km)</i>
MSU-MR Low-resolution multi-channel scanning unit	Global and regional cloud cover mapping, ice and snow cover observation, forest fire monitoring, ...	0,5 – 12,5µm (6 channels)	3000	1 x 1
KMSS Visible spectrum scanning imager	Earth surface monitoring for various tasks (floods, soil and vegetation cover state, ice cover)	0,4-0,9 µm (3+3 channels)	450/900	0,05/0,1
MTVZA-GY Imager-sounder (module for temperature and humidity sounding of the atmosphere)	Atmospheric temperature and humidity profiles, sea surface wind	10,6-183,3 GHz (26 channels)	2600	12 – 75
IRFS-2 Advanced IR sounder (infrared Fourier-spectrometer)	Atmospheric temperature and humidity profiles	5-15 µm	2000	35
“Severjanin-M” Synthetic aperture radar	All-weather Ice coverage monitoring	9500-9700 MHz	600	0,4 x 0,5
GGAK-M Heliogeophysical instrument suite	Heliogeophysical data providing			
BRK SSPD Data Collection System	Data retransmission from DCP			

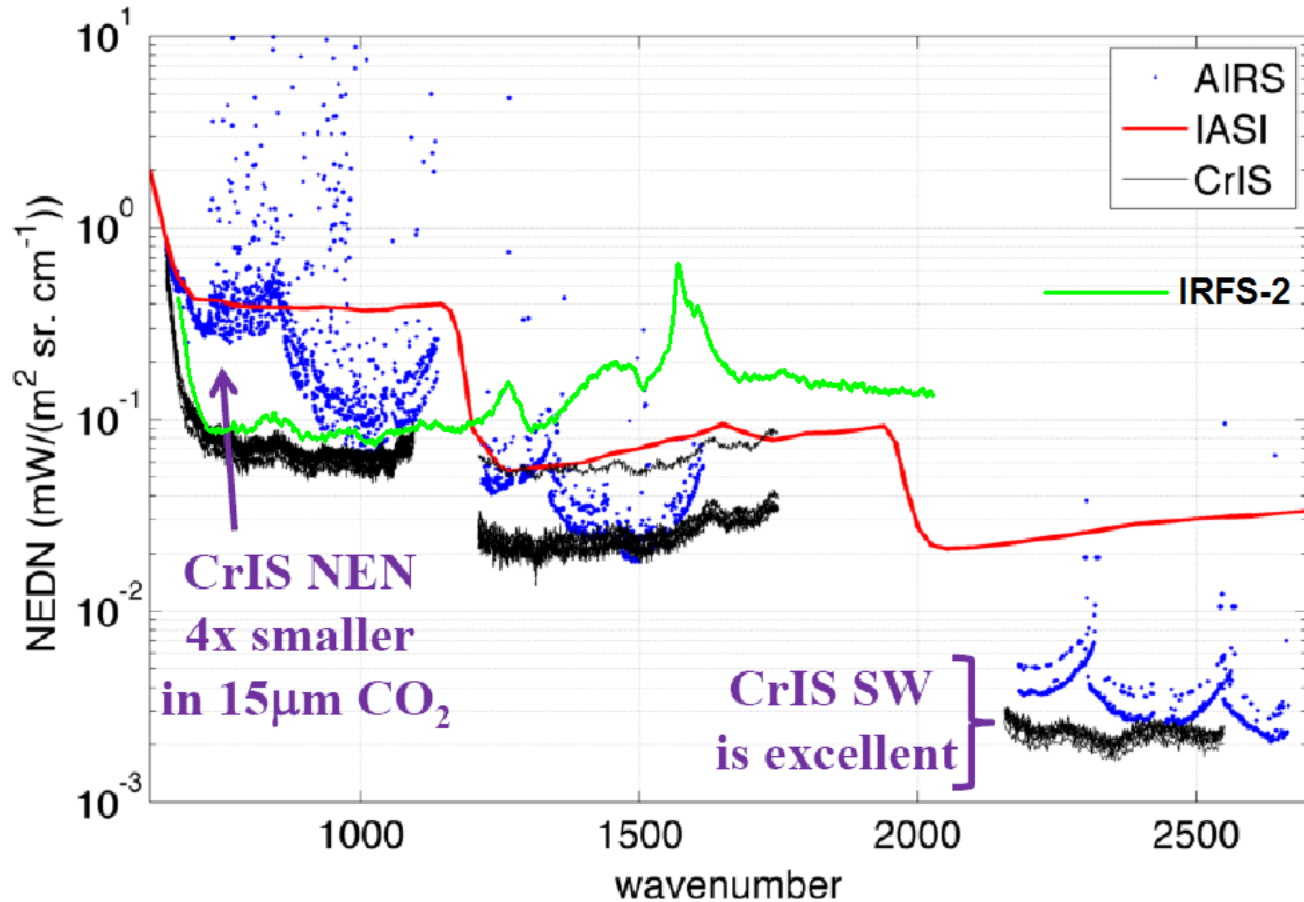
IRFS-2 Basic Performance Characteristics



<i>Parameter</i>	<i>Units</i>	<i>Value</i>
Spectral range: wavelength wave number	μm cm^{-1}	5-15 2000-665
Reference channel wavelength	μm	1.06
Maximum optical path difference (OPD)	mm	17
Angular size of FOV	mrad	40 x 40
Spatial resolution (at sub-satellite point)	km	35
Swath Width and spatial sampling	km	2500, 110 2000, 100
Duration of the interferogram measurement	s	0.5
Dynamic range		2^{16}
Mass	kg	45-50
Power	W	50

<i>Spectral region</i>	<i>Absorption band</i>	<i>Application</i>
665 to 780 cm^{-1}	CO_2	Temperature profile
790 to 980 cm^{-1}	Atmospheric window	Surface parameters (T_s , ϵ_v), cloud properties
1000 to 1070 cm^{-1}	O_3	Ozone sounding
1080 to 1150 cm^{-1}	Atmospheric window	T_s , ϵ_v ; cloud properties
1210 to 1650 cm^{-1}	H_2O , N_2O , CH_4	Moisture profile, CH_4 , N_2O , column amounts

Noise Comparison: CrIS, AIRS L1B, IASI L1C and IRFS-2



Spectral resolution, cm^{-1} , in region $650\text{-}1000 \text{ cm}^{-1}$	
IASI	0.35
CrIS	0.625
IRFS	0.5

This figure was based on a figure from: W. Smith, E. Weisz, et al Weather and Climate Applications of Ultraspectral IR Radiance Measurements, IRS 2012, 06-10 August 2012, Dahlem Cube, Berlin Germany