

Future Geostationary Meteorological Satellite Systems

SPACE MONITORING OF EARTH HIGH-ALTITUDE REGIONS BY THE ELECTRO-L TYPE SATELLITES IN MOLNIYA ORBIT.

Summary and purpose of the WP

RSC Planeta and Lavochkin Association developed conceptual proposals for creation of perspective space system for hydrometeorological monitoring of the Arctic region.

Tasks of Arctic are similar to those of existing geostationary meteorological satellite systems. Primary purpose is receiving of the information for the analysis and the forecast of weather in regional (Arctic regions) and global scale.

Suggested design of SC Arctic-L offers capacity for mass and power supply for additional payloads accommodation that provides certain opportunities for international cooperation activities.

Action proposed: for EUMETSAT, NOAA and WMO to review usefulness of Arctic system in Molniya orbit and to propose possibilities of co-operation in this system creation.

SPACE MONITORING OF EARTH HIGH-ALTITUDE REGIONS BY THE ELECTRO-L TYPE SATELLITES IN MOLNIYA ORBIT.

RSC "Planeta" and Lavochkin Association developed conceptual proposals for creation of perspective space system for hydrometeorological monitoring of the Arctic region (highly eccentric hydrometeorological space system "Arctic").

Tasks of "Arctic" are similar to those of existing geostationary meteorological satellite systems. Primary purpose is receiving of the information for the analysis and the forecast of weather in regional (Arctic regions) and global scale.

"Arctic-L" satellite constellation will consist of 2 satellites (SC) with the following nominal parameters of orbits:

- apogee height (α) ~ 40000 km;
- perigee height (π) ~ 1000 km;
- inclination (i) ~ 63°;
- orbital period ~ 12 hours.

The ascending node of SC # 1 orbit and the descending node of SC # 2 orbit will be at a short distance or coinciding. Duration of operational segments when monitoring is provided is 6.4 hours. Altitude of operational segments is 29000 to 40000 km. It will provide quasi continuous monitoring of northern (Arctic) regions with Zenith angle less than 70°.

Areas of quasi continuous monitoring are:

- all northern areas beyond 60° N with the maximum possible quality of the video data;

- a whole or insignificantly truncated Earth disk.

Periodicity of measurement sessions is 15...30 minutes.

SC "Arctic-L" is based upon available Lavochkin Association's scientific and technical experience from SC "Spektr-R", "Electro-L" and operating experience of other SCs for Earth monitoring in highly eccentric orbits. Payload subsystems will be similar to the onboard equipment used in "Electro" space system after required modernization.

Suggested design of SC "Arctic-L" offers capacity for mass and power supply for additional payloads accommodation that provides certain opportunities for international cooperation activities.