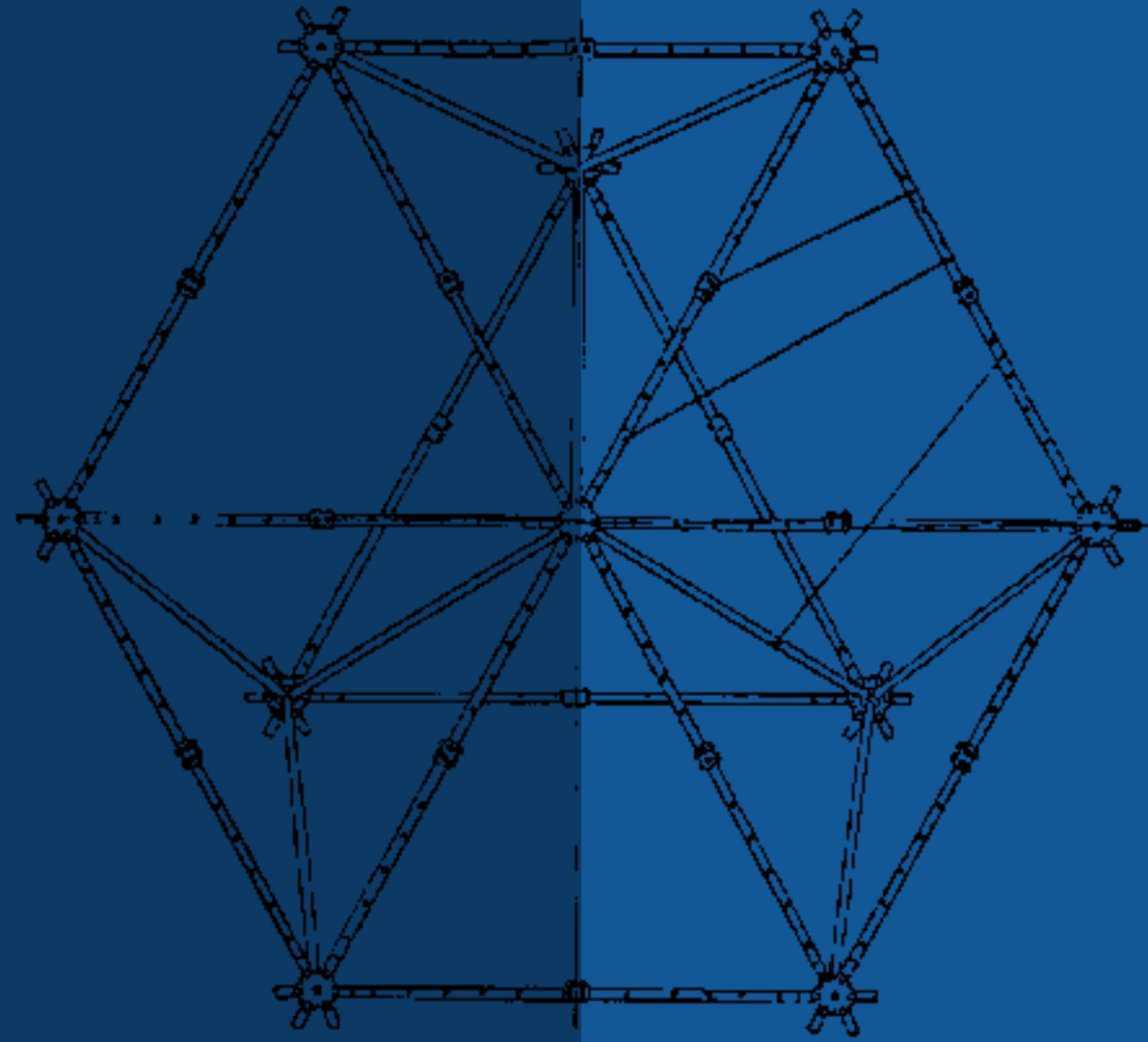


Scientific Center of Applied Electrodynamics JSC

Synthetic Aperture Radars
space-based



Saint-Petersburg, 2021

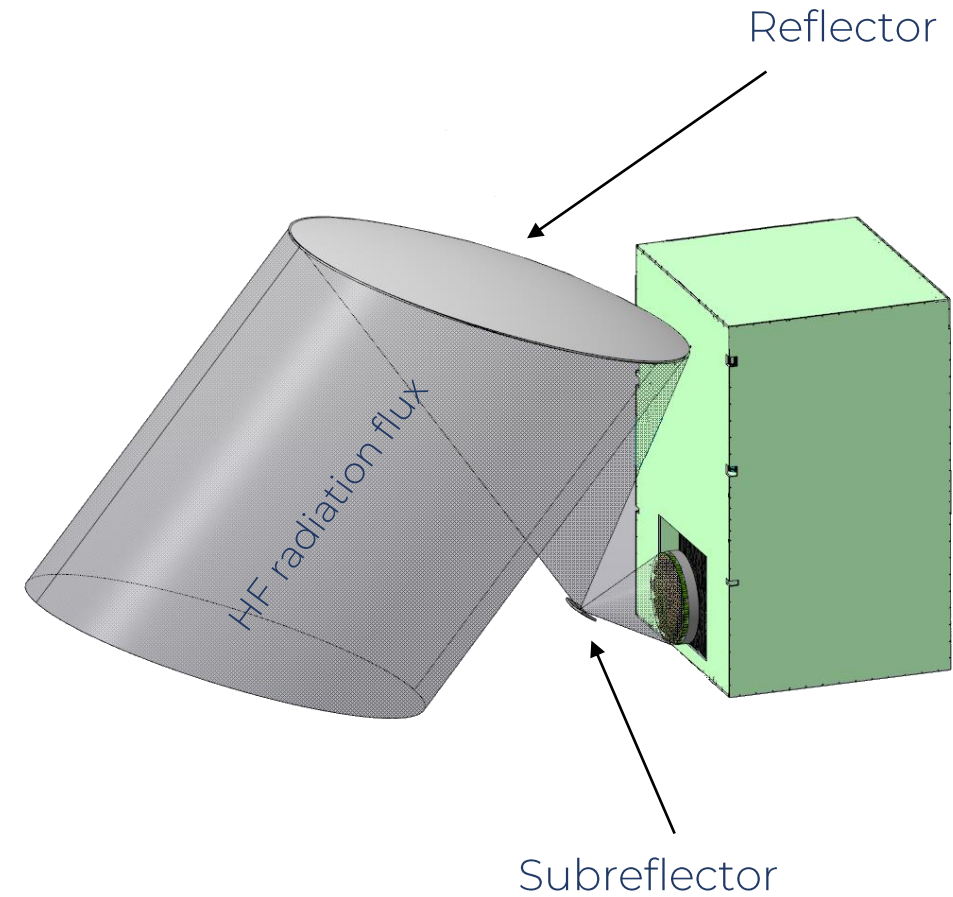
Hybrid reflector antenna

Antenna is used for remote earth sensing, carried out using multifrequency polarization radars with synthetic aperture.

The reflector antenna has a high gain and a relatively low mass.

Table 1. Technical characteristics

Parameter	Description
Bandwidth	S ($\lambda=10$ cm) и X ($\lambda=3$ cm)
Weight	100 kg
Antenna dimensions	5 x 5 m
Sensibility	-20 dB
Maximum resolution	2,5 m
Polarization	4 modes at each frequency

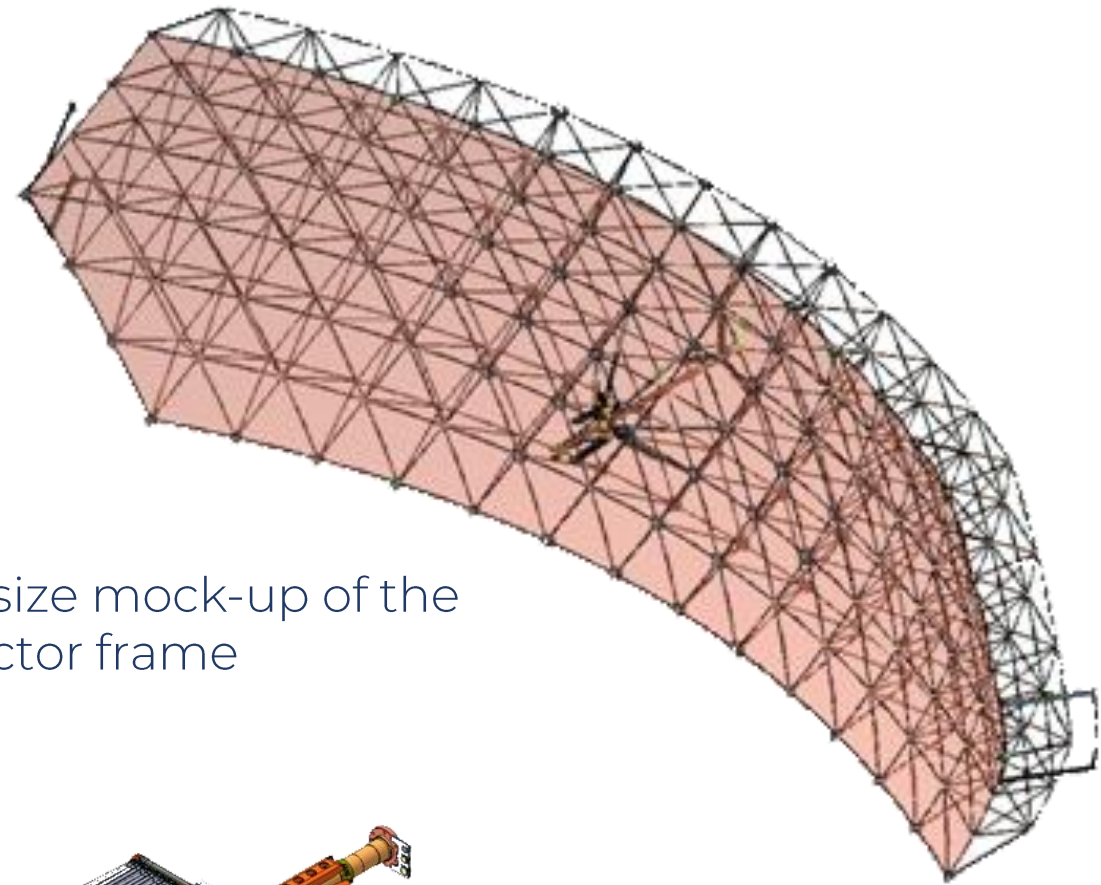


Deployable onboard reflector antenna

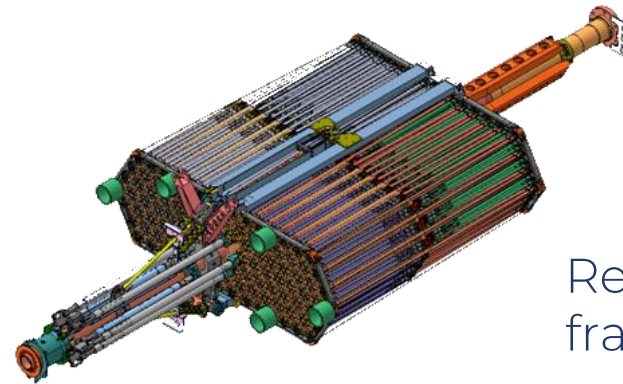
SCAE JSC has developed and manufactured a model of a large-size reflector of a space self-expanding antenna based on a *truss-rod* frame. The reflector is based on nodal pivots, folding rods and diagonal rods.

The size of the reflecting surface reaches 12 x 4 m, the focal length is 5 m, and the standard deviation of the reflecting surface is 1.5 m.

The reflector weight does not exceed 78 kg. The operating temperature range is from -150 up to +125 °C.



Full-size mock-up of the reflector frame



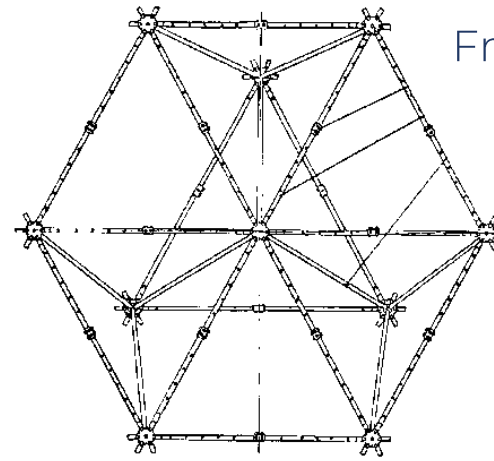
Reflector mock-up frame in folded position

Deployable onboard reflector antenna.

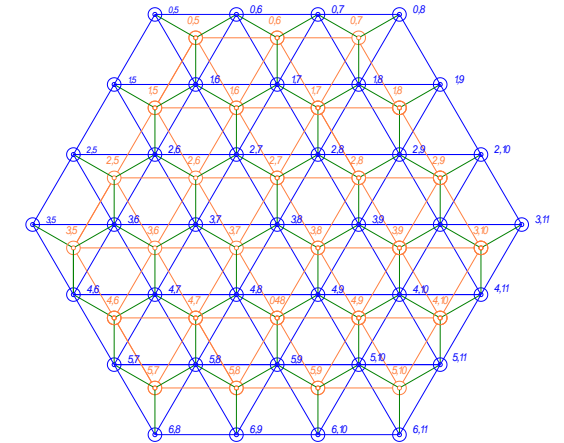
Fragment

In spite of the similarity of the structural design with the already existing structures based on truss rod frames, a number of significant changes were made to the design of the reflector developed by SCAE JSC, including:

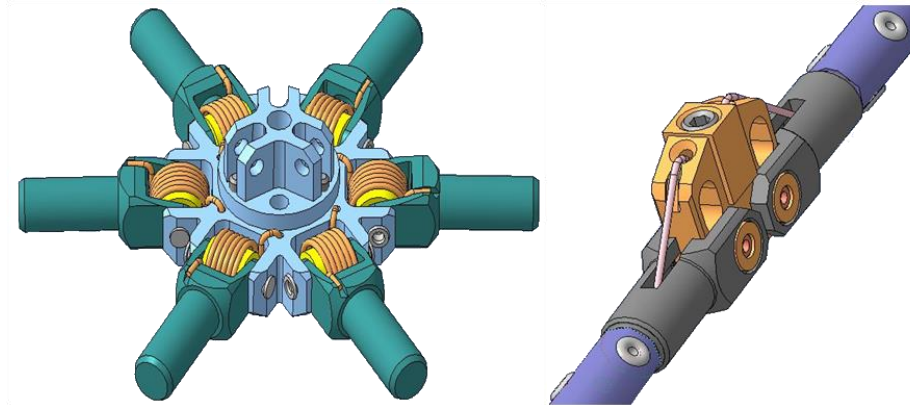
- to increase the reliability of deployment, the energy of the springs is significantly increased;
- to reduce dynamic loads, a controlled deployment was introduced.



Frame fragment



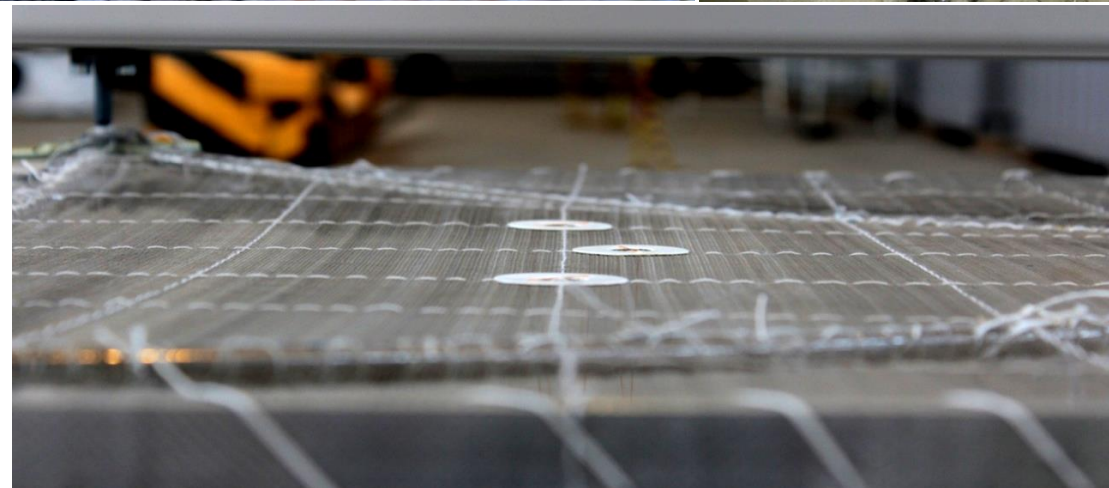
Structure of the truss rod frame



Body assembly and folding front rod

Implementation

The computational justification and experimental studies of the reflector's possibility of application in terrestrial conditions have been carried out. The operating capacity in terms of the overall strength, stability of the rods and the root-mean-square deviation of the reflecting surface from gravitational and wind loads at an average wind speed of up to 15 m / s has been confirmed.





In case of additional questions the company can
provide more detailed information

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