

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Fixed and Broadcast Communications (2)

Author: Mr. Ilya Iuskevich

Skolkovo Institute of Science and Technology, Russian Federation, ilya.yuskevich@skolkovotech.ru

Prof. Alessandro Golkar

Skolkovo Institute of Science and Technology, Russian Federation, golkar@skolkovotech.ru

Dr. Victor Doniants

D.C.Orbital LLC, Russian Federation, vnd@dcorbital.net

REGIONAL MEO INTERNET BROADCASTING SYSTEM OPTIMIZED FOR RUSSIAN
FEDERATION COVERAGE**Abstract**

Fixed satellite services for IP content delivery will soon become commercially non-competitive due to the emergence of fiber optics and 5G technologies in high urban density regions of the world. The Russian Federation is a potential exception to this trend. Russia is still the largest country in the world, with very low population density and spanning eleven time zones. The spatial distribution of the Russian population makes regional MEO satellite Internet coverage a potentially attractive solution for remote and hard to reach areas, solving the Russian digital divide. Nevertheless, a competitive solution to this end needs to be designed. This paper presents the MEO SKY-F system as a feasible space-based solution to the Russian digital divide. The project proposes to launch by 2020 seven satellites (6 operational + 1 stand by) into a circular MEO orbit with near to polar inclination for regional Earth coverage in Ka-band. The system will provide seamless IP-broadcasting above 42 North and below 42 South with limited coverage in Equator areas. Ka-band frequencies (1300 MHz bandwidth in total) are already assigned to the project. This paper describes the outcomes of a preliminary design study of SKY-F. The envisioned spacecraft design solution is based on a Software Design Satellite approach, coupled with a regenerative or bent pipe communications payload. The paper will present alternative solutions for the SKY-F satellite design optimizing total Russia coverage with maximum IP-throughput to compete with other proposed MEO- or GEO-systems oriented to global IP-coverage delivery. The paper further describes a nanosatellite proof of concept to be launched by 2019 as precursor to the envisioned SKY-F.

* - Skolkovo Institute of Science and Technology, Moscow, Russia ** - D.C.Orbital LLC, Moscow, Russia