SMALL SPACE PLATFORM FOR SCIENTIFIC AND TECHNOLOGICAL EXPERIMENTS

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We develop a special transport-launch container which can be implemented for associated launch with "Progress" transportation. The transport-launch container will be deployed on the outer structure of the "Progress" transportation. It is possible to install up to 16 of 6U-formfacor containers. Launch of the small satellite on the stage of autonomous flight "Progress" transportation to dock with the ISS (Russian Segment) is possible between the first and second jet pulse at 40-45 min after launch. In this case small satellites orbit will be about 300-330 km.

Ballistic scheme of the releasing small satellites is following.

- shooting perpendicular to the direction of flight,
- shooting in the orbital plane of "Progress".

If the orbit of the ISS satisfies the purpose of the small satellites, then it is possible to release up to 2 containers automatically when "Progress" is docked to ISS.

And finally, there is an option after undocking and to lift up "Progress" transportation into higher orbit. In this case the orbit of releasing satellites will be 500-550 km.

«Progress» transportation is launching 4 times per year, hence this is cheap opportunity to launch small satellites for different purposes: Earth remote sensing, AIS, science etc.

As an example we discuss a Cluster experiment for Terrestrial Gamma Flashes (TGF) investigation. It is intended to launch in total up to sixteen 6U satellites (platform MKA-N) as a single piggyback payload of “Progress” transportation into LEO orbit of about 350 km. Each satellite will be equipped with identical scintillation detector for gamma-ray registration in an energy range 0.1 – 10 MeV with photon time accuracy counting of 1 mcsec. The mission consists of active and passive phases. In the initial active phase (up to 2 years) the satellites will be clustered in the orbit with mean distance between guided satellites of about 50 km. In this phase the single TGF can be detected by several detectors, and using differences in intensity of detected signal and triangulation technique one could make a localization of the TGF source location based solely on gamma-ray observations. Additionally in the active phase full coverage of thunderstorm areas for multiple TGF registration will be provided. In a subsequent passive phase each satellite provides TGF detection of different areas of the Earth. In both phases the Cluster experiment will be able to register cosmic Gamma-Ray Bursts (GRB) and Solar flares, and in the passive phase it can provide detection of cosmic gamma-ray sources for un-obscured by the Earth 4*pi solid angle.