

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Small Launchers: Concepts and Operations (7)

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SCHEMATA OF AVIATION-ROCKETRY SYSTEMS FOR SMALL SPACECRAFT LAUNCHES.  
OPPORTUNITIES FOR REALIZATION. ANALOGUES AND PROTOTYPES

**Abstract**

Development of small spacecraft requires to develop complying launch technologies. The most perspective direction is working out aviation-rocketry systems (ARS). Such systems are actual for Russia because of problems of launch tracks and launch vehicle stages downfall zones of sun-synchronous missions. The great fleet of planes and launch vehicles and extensive experience of their development is a good basis for ARS development. Prototypes for the ARS plane-carriers may be serial An-12, MiG-31, Il-76, An-178 and perspective supersonic business jet. Prototypes and analogues for the ARS are seen such well-known projects as -15, Pegasus, -34, Ishim, and little known but original projects too. Good results in the creation of the ARS and especially its operating may be obtained from a broad international cooperation; and ENERGIA Corporation has accumulated a long positive experience of it (Intercosmos, Mir-NASA, SeaLaunch, ISS, BelKA and other programs).