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

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## DEVELOPMENT OF A METHANE/LIQUID OXYGEN ORBITAL LAUNCHER FOR SMALL SATELLITES

## Abstract

The authors have started development of a low-cost liquid fuelled rocket named ZERO, that is propelled by a newly developed gas generator cycle liquid fuelled engine and capable of launching a 100kg micro satellite into 561km altitude sun synchronous orbit. We had conducted research and development of hydrocarbon fuel. We choosed liquid methane as fuel of ZERO launcher. We have tested methane/LOX engines and injectors for research and tested inducer for liquid fuel. We have tried to use well confirmed industrial technologies and commercially available materials and parts, in order to reduce the development cost drastically compared to legacy launch vehicles. In this paper, concept design and results of some of the firing tests conducted for obital launcher ZERO are reported.