

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)

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Author: Mr. Luca Mastrangelo

University of Rome "La Sapienza", Italy, belozman@hotmail.com

ANALYSIS OF LAUNCH METHODS FOR SMALL SATELLITES

Abstract

The aim of the proposed paper is to analyze methods to launch small size satellites. The use of small satellites is lately growing because of the many advantages related to decreasing size. There is a great potential for reducing the costs related to the design and the manufacturing, by means of mass producing simple and small satellites rather than individually crafting unique satellites. Moreover, reducing the size and the weight, there are lower launch costs with a consequent flexibility in launching and increasing accessibility, i.e. number of possible launches. In such an optic, reliable and fast methods for launch need to be defined. The paper will describe criteria on which the choice of launch strategy for microsatellite is based. Intrinsic factors, such as mass capability, orbit injection performance, fairing capacity, payload environment and offered micro satellite launch options (piggy-back, shared or dedicated) will be considered during the analysis, together with external characteristics, like costs, reliability, and accessibility. No restriction based on political issues will be considered as a choice parameter. After a complete analysis of existing launch methodology, a peculiar mission involving microsatellite will be analyzed for design. The analyzed mission will be based on a LEO sun-synchronous orbit for Earth observation. The analysis will include the study of the launch mission (in terms of reference trajectory and consumption) and the evaluation of loads acting on the satellite during launch. The main objective is to provide an overview of launch possibilities together with criteria for the best solution to be adopted, supported by a specific mission analysis.