

26th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Generic Technologies for Small/Micro Platforms (6A)

Author: Mr. Nabil Souhair
Space Generation Advisory Council (SGAC), Italy, nabil.souhair@gmail.com

Mr. Andrea Togni
Space Generation Advisory Council (SGAC), Italy, me.andrea.togni@gmail.com

FROM CUBESATS TO MICROSATS STANDARDIZATION: REDUCING COSTS BY GENERATING
A SCALE ECONOMY

Abstract

The CubeSat is a popular class of satellites belonging to the family of nanosatellites, composing of standardized modular units of 10 10 10 cm with a maximum weight of 1.33 kg. There exist also smaller standards, such as the PocketQubeSat (max 1 kg), the TubeSat (max 0.75 kg), and the ThinSat (max 0.25 kg). As of 2019, over 1000 CubeSats were deployed in orbit. Their success is mainly due to their miniaturization which allowed a standardization in their design and thus a drastic reduction of their cost. However their main limitation lies in their very small size: the current status of payload miniaturization for several missions is often not yet mature enough to adapt to such small platforms. In this regard, the microsatellites (10 - 100 kg) seem to be very promising. The MicroSats have not yet been standardized: the number of satellites launched is an order of magnitude lower than the CubeSats and it is mostly customized solutions. In this work, a complete survey of the standardization requirements for the class of MicroSats weighting about 50 kg is done from system requirements to system level design, considering also launch capabilities and satellite deployer. A standardization for this class of satellites is expected to lower their costs enabling an economy of scale in their production and thus raising their popularity among small agencies, institutions and emerging countries.