Commercial missions using cube/nanosats – IAA-LA-01-02

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Cubesats have appeared in the space world at the beginning of the century. Initially created for college students to practice with hands on concrete space projects, it has so far escaped from this orbit to be seen as a potential tool for feasible economic projects, generating useful and valuable data in many different applications.

The paper discusses the path followed since the initial cubesats were launched in the world and in Latin America in particular to become a potential tool for economically feasible missions. Different applications are discussed for remote sensing, meteorology, data collection, communication, IoT and others, both for civilian as well as for defense applications. For each of these applications technical parameters that presently seem to limit further use of this type of satellite for commercial missions are also discussed, both for launching and for the satellites, as well as trends to solve it. It is presented an actual world scenario and in particular for Latin America where these missions are either already used or present potential for use. Based on the authors experience it is also discussed the approach for financing these missions both at public and in private sectors. The investment fund approach, particularly in Brazil is also discussed, as an example.

The paper also presents the actual effort to create in the international community standards for this type of satellite and its testing, that can accommodate commercial use of it, without loosing its low cost characteristic, updating and expanding the original CDS (CubeSat Design Specification) documentation, presently over its revision 13 for 1U and 3U and that provisionally presented last year for a 6U. Finally, it also shows different approaches for subsystem radiation hardening or fault tolerance techniques to increase system reliability and mission duration. Both single satellite missions and constellations are presented.