

SPACE SYSTEMS SYMPOSIUM (D1)  
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## AQUILASAT CREATING A MULTIPURPOSE CUBESAT PLATFORM FOR SPACE EXPLORATION

**Abstract**

The CubeSat-trend in satellite technology is gaining momentum. The number of launches of CubeSats and even CubeSat constellations is increasing on a year-by-year basis. However, one significant step is still incomplete: the use of CubeSat technology for space exploration purposes. Sending small spacecraft outside the Earth magnetic and gravity fields presents major challenges and it requires specific design and engineering that differs from the "usual" CubeSat technology. At the same time such mission might significantly lower the price of space exploration. This abstract and the proposed presentation will analyze the potential for using CubeSat technology for space exploration outside Earth magnetic field and it will share the current development of AquilaSat project. The radiation shielding, specific ION engine propulsion technologies, customized Attitude Determination and Control System and radiation-hardened fault tolerant onboard computer configuration might open-up new opportunity for CubeSat utilization. Moreover, the usage of flight formation of CubeSats and even capability for launching from larger spacecraft will amplify immensely the capabilities and the redundancy of such systems for space exploration missions. The major advantage of the proposed system lies in the highly reliable Space autopilot (including analytical and adaptive AI software) along with an integrated Space collision avoidance system. Such project will require precise positioning and guidance technology, especially during a close formation flight with another spacecraft. Finally the mission duration goal is 7 years beyond Earth orbit.

Keywords: CubeSat, CubeSat constellation, Space systems, Space technology, Space Exploration