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SCIENTIFIC SPACE MISSION WITH PICO SATELLITE STANDARD FOR PRE-COLLEGE EDUCATION

Abstract

It is noticeable the exponential repercussion of space technology worldwide, especially because of the reach that space education has. Inspired by how this theme can open new possibilities to work science at high school age, this article presents the process to conceptualize, project, build and launch a high school satellite to study the South Atlantic Magnetic Anomaly (SAMA). The mission concept started in mid 2020, during the peak of the COVID-19 pandemic. During this time, with schools adopting an online class model, much of the classroom's experiences were lost for the students. The Brazilian student Kevin Xilai Tang searched for other ways to learn and practice Science and Project Methodologies, and that was when he found in Space Education a way to achieve this objective. Cubesats and PocketQubes gave Space Education an easy way to help students experience a Space Mission and apply the knowledge of Science and Project Methodologies. The project GalaxySat-1 was created. It is made of a PocketQube model satellite, with 50x50x50mm and 250g, which lowered the launch price and presented new challenges for the project, like space optimization and compartmentalization. Because of its mass and size, this satellite is a great way to make a space mission with a small team, and yet, make it possible so that every person involved in the project can contribute and learn with it. Not only the project design presents a lot of learning, but also the building process did also present a "learn with failure" lesson. Since the satellite model chosen for the mission is cheaper than other space projects, it makes it possible for a "do fast, test, fix and learn" process. Space has become more accessible with pico satellite standards like PocketQube, in a way that students can have similar experiences like this project before entering college. And to help this become more and more a reality in Brazil, the GalaxySat-1 is an open-source material that every student around the world can be inspired by to make space science. Overall, this article presents all the experience of a High School Satellite that focused on the learning process and the learning through failure experiences, and presents the technology and design applied on the mission.