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Small Earth Observation Missions (4)

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THE SCOUT FRAMEWORK: ESA'S EARTH SCIENCE SMALL SATELLITES PROGRAM

Abstract

In the recent past many new opportunities have been created, based on the so-called NewSpace paradigm, exploiting technology advancement such as smallsat and cubesats which utilize Commercial-Off-The-Shelf components and an incremental development approach resulting in fast turnaround and low budgets. So far, most of these opportunities relate to in-orbit demonstration or commercial missions. A few years ago, the Earth Observation directorate of the European Space Agency started a new endeavour to exploit the opportunity to utilize the New Space paradigm and technologies to develop and deploy small size science missions for Earth Observation. This new initiative is based on three pillars: relative short turnaround (3 years to flight acceptance), small budget (35 M) and combine the capability of European New Space industries in delivering innovation with the more than thirty years of experience of ESA in Earth Science Missions. This new framework, called Scout to highlight its exploring aspects, is organized in cycles, to identify potential candidate missions, assess them and down-select missions for implementation. One common factor to all Scout missions is the delivery of Level 2 science products to the international science community with a free and open policy as for all other ESA Earth observation science missions. The first Scout cycle is on-going, with one mission, HydroGNSS based on a constellation of two satellites with the first already well underway its qualification and the second in the assembly phase with the launch foreseen in early 2025. Two new Scout missions, NanoMagSat and TANGO, are planned to enter their implementation phase in the third quarter of 2024. NanoMagSat is based on a constellation of three satellites while TANGO is a tandem of two satellites flying in formation. Both missions are planned to be launched by the end of 2027. In parallel, the preparation of the second Scout cycle is expected to be initiated in May 2024, and will implement the recommendations resulting from the 360-degree lessons-learned exercise conducted by ESA on the first Scout cycle to improve the second cycle following the NewSpace philosophy of continuous and iterative improvement. The Scout cycles, when in steady state, aim to deliver two new missions providing and innovative science every 3 years. This paper will present the latest status of the evolving Scout framework. It will give an overview of the Scout missions highlighting innovations, applications as well as challenges and achievements.