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EUROPEAN APPROACH FOR SPACE EXPLORATION TECHNOLOGY PROCUREMENT: METHODOLOGIES AND TOOLS

Abstract

In preparation of upcoming decisions to be taken in the international arena on further steps in Space Exploration, technology maturation and innovation has become an essential element to guide succesfull choices for future missions and architectures.

Technology Roadmaps for Space Exploration are an instrument introduced by ESA in the recent years to support the broad approach of Coordination on Exploration at international level.

They are intended to: Provide information on technology developments; link the different technology developments to the relevant ESA Exploration strategy's missions; correlate the different technologies to the potential strategic Building Blocks; provide information on the compliance between the Strategy and the enabling technologies developments; support technology funding Prioritisation; envisaging possible Demo missions within the suggested TRL incremental path; help in identifying potential areas for international collaborations.

The prepararation of a 3rd edition of the ESA Exploration Technology Roadmaps has been initiated, following the first two editions in 2012 and 2015 respetively. This new edition is needed: to align the Roadmaps with technology funding priorities decided in 2016; to update the Missions / Building Blocks and Operational Capabilities (the Roadmap's pillars) in favour of a better interaction with potential international partners and to take into account decisions taken by ESA during the last ESA Council at Ministerial level in December 2016; to include some ESA stakeholders so far under-involved (such as the European Astronaut Centre, etc.); to support a new technology prioritisation process, based also on methodologies derived by the roadmaps; to prepare for an effective dialogue on space Exploration with International partners (NASA, etc.). Concerning the last point, Technologies for exploration are being developed also by possible future international partners on Exploration missions: the roadmaps can be used to support exchange with them to identify areas suitable for cooperation or for a clear separation

of responsibilities for the procurement of enabling technologies, aiming eventually to the definition of Joint Technology Roadmaps This paper presents the Roadmaps' organization and structure as well as the approach followed by ESA to generate and validate the Roadmaps. A web-based tool, called TREx, developed to facilitate the maintenance of the roadmaps by the domain specialists and to enable the review with external stakeholders is presented. Finally, the work carried out by Academia to develop technology prioritization methodologies linked to the Roadmaps is also included in the paper.