

Identification of User Needs and Possible Platforms for Future Microgravity and Space Experimentation

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Abstract

Space is a unique environment in which to perform operations in conditions of near-zero gravity, high radiation and hard vacuum to enable new developments in science and technology.

Facilities to study the effects of space environmental conditions on physical, chemical and biological processes exist but the cost, reliability, availability and frequency of space access continue to be limiting factors. However, significant progress is being made to both improve space launch options and provide access to useful platforms.

The ISS has been serving the microgravity and space experimentation industry for decades and remains the most utilized platform for experimentation. This is true despite the fact that ISS resources are increasingly limited for European use and that the platform does not cover all experimental domain needs. In any case, European participation to ISS is guaranteed until 2024 but not beyond that and this calls for new strategies that will take advantage of other platforms.

ESA's SciSpacE program already supports experiments on other platforms, however in addition new, non-traditional, commercial platforms promise to be operational and offering experiment campaign opportunities within the next 10 years.

ESA Study and Objectives

Telespazio-VEGA have recently performed a study for the ESA to identify, characterize and synthesize the nature of these additional new platforms with respect to the needs and requirements of existing and future microgravity and space experimentation users in Europe. The study set four objectives as follows:

1. Identify typical, representative users of future microgravity and space platforms.
2. Identify specific needs and requirements for these users.
3. Identify possible future microgravity platforms satisfying these requirements.

4. Map user requirements to platform capabilities

5. Develop possible scenarios, including ROM costing and availability, for use of these platforms

Results and Conclusions

This presentation will highlight some of the results of this study, which includes feedback from over 300 researchers collected via survey and data from around 60 platforms investigated in order to map user requirements to provider capabilities. It will discuss key details of study findings and will outline the most applicable platforms for future research needs based on user input.

The presentation will also address our observations and assessments of likely future platform developments and user trends. It will involve a discussion of how Industry could be encouraged to pursue commercial development and/or operation of these new platforms in order to ensure continued European access to a long-duration microgravity environment and to promote the development of future European space business that deliver substantial benefits to all European citizens.