

ESA debriefing on the evaluation of “Galileo Galilei” (GG) proposal.

Summary of the teleconference held December 12, 2012

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In June 2012 GG was submitted in response to ESA Call for a small mission opportunity in 2017. In October 2012 ESA communicated the selected proposal.

ESA policy was not to provide any written assessment of the submitted proposals, neither public nor to individual proposers. However, ESA offered a debriefing to interested proposers on their respective proposal.

A debriefing teleconference on GG was held December 12, 2012, with Ana Heras from ESA Science Coordination Office, Anna Nobili from the University of Pisa & INFN as PI of the GG proposal and Alberto Anselmi from TAS-I, Torino as project manager of previous GG industrial studies conducted by TAS-I under ASI (Agenzia Spaziale Italiana) funding.

Ana Heras proposed the following debriefing structure:

- General proposal evaluation approach for the Small mission call
- Information on the evaluation of your proposal
- Your feedback on particular issues or difficulties you encountered in the preparation of the proposal, and other comments you may have in relation with the call

On the first item the key issues for ESA made clear by Ana Heras were:

- that the small mission should be ready for launch by 2017
- that all technology involved should have been demonstrated to Technology Readiness Level TRL5 minimum
- that the cost at completion to ESA should be ≤ 50 M€.

Ana Heras informed that GG was not included in the shortlist sent to the ESA science panels because ESA technical staff found the following problems with it:

1. AOCS (Attitude and Orbit Control System) needed re-qualification because GG is a spinning spacecraft and the schedule for the development of a new platform to be launched in 2017 was regarded as marginal
2. The GG instrument/payload was not at TRL5
3. The total GG estimated cost of 85 M€ was found to be correct (save for a small underestimate of ESA mission operation cost), but the proposed cost share between ESA and ASI was not compatible with information provided by ASI

ESA technical staff found the GG mission profile to be good but judged that – because of the problems listed above – GG could not fit in the 5-yr baseline of the Call with launch in 2017 and with a cost to ESA within the 50 M€ cost cap.

Both Anna Nobili and Alberto Anselmi agreed on the cost share issue (item no.3) since the total cost of GG required ASI to seek and secure the participation from third parties (primarily JPL-NASA) within the very limited time available for the small mission selection by ESA. Concerning the other two issues Alberto Anselmi pointed out what follows:

1. AOCS for GG was studied in depth by TAS-I in 2009 within a GG Phase A2 Study funded by ASI. TAS-I study of AOCS for GG was based on expertise acquired in the realization of GOCE, which was launched in March 2009 and has operated very successfully ever since. The issue raised is that, unlike GOCE, GG is stabilized by one-axis rotation. One-axis stabilization is an old technology. For drag compensation the GG spin rate was reduced to 1 Hz. At this rate no critical issues were identified in the course of the Study. The conclusion was confirmed in 2011 by a delta study using as actuators the cold gas thrusters space qualified for GAIA and selected for μ SCOPE (the requirement on drag compensation for GG is 180 times less stringent than it is for μ SCOPE and 6000 times less stringent than it is for LISA-PF). The GG Phase A2 Study was based on a 4 year development time from start of Phase B to launch, somewhat more tight than the schedule of the ESA Call.
2. The GG payload involves mechanical suspensions, capacitance sensors (as input to the drag free control and during the commissioning phase of the instrument), and laser metrology. None of these technologies is new. All of them are well proven. They are used to set up a new experiment.

In summary, there was agreement on the GG cost share issue (item no.3) while on items no.1 and no.2 A. Nobili and A. Anselmi stood by the conclusions of the GG Phase A2 Study. The outcome of the Study is with ASI and by decision of the President was shared with JPL in 2010.

A. Nobili was grateful to ESA for the debriefing. It helps to learn for the future and allows this information to be shared with all scientists who supported the GG proposal worldwide.