Subject: LARES 2 metal alloy URGENT
Date: Thursday, April 26, 2018 at 5:31:28 PM Eastern Daylight Time
From: Antonio Paolozzi
To: David Arnold
CC: Ignazio Ciufolini, Erricos C. Pavlis

Dear Dave,
the two possible alloys for LARES 2 are Nichel based and Copper based. The best from the mechanical point of view is the Nichel alloy,However its conductivity is very low (about 10 W/(mK) wrt 170 of copper alloy). We estimated with Richard Matzner the following temperature gradients on the metal body of the LARES 2 satellite:
Nichel alloy Delta T= 12 K
Copper alloy Delta T = 1 K

This gradient will introduce an error in the thermal thrust that will reduce the accuracy of the Lense-Thirring experiment by about 0,1%. Erricos is also very worrried about the loss of ranging accuracy which although will not affect the general relativity test will be very important for all space geodesists which are looking tor submillimiter accuracy. So we kindly ask you if you could somehow evaluate what the accuracy loss would be for the two different alloys. Unfortunately ASI has informed us today that they have chosen Nichel alloy because of launch schedule and because the Nichel alloy has already beed used for space components. But we are not very happy about this choice.

It would be very important if you could send us, within tomorrow, an estimate of the accuracy loss in the ranging so that in case this loss would be higher than a mm we could try to convince ASI to change from Nichel to Copper alloy tomorrow morning (Italian time) before they order the alloy.

Thank you and best regards
Antonio e Ignazio