SPACE EXPLORATION SYMPOSIUM (A3)
Solar System Exploration (5)

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ORBIT DETERMINATION FOR THE RADIO SCIENCE EXPERIMENT OF THE NASA MISSION JUNO

Abstract

Juno is a NASA New Frontiers mission to the planet Jupiter, launched from Cape Canaveral last 5 August. The spacecraft will arrive to Jupiter in 2016 and will be placed for one year in a polar high-eccentric orbit to study the composition of the planet, the gravity and the magnetic field, and the magnetosphere.

The Italian Space Agency (ASI) contributed to the mission providing the radio science instrument KaT (Ka-Band Translator, developed by the University of Rome "La Sapienza" and Thales Alenia Space) used for the gravity experiment, which has the goal of studying the Jupiter's deep structure by mapping the planet's gravity. Such instrument takes advantage of synergies with a similar tool in development for BepiColombo, the ESA cornerstone mission to Mercury.

The Celestial Mechanics Group of the University of Pisa and SpaceDyS s.r.l. are responsible, under an ASI contract, for the development of an orbit determination and parameters estimation software for processing the real data independently from NASA software ODP.

We shall present the state of the art of such software highlighting the theoretical models used, the problems addressed and first results about the scientific goals obtained with simulated data.