

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Radiation Fields, Effects and Risks in Human Space Missions (4)

Author: Dr. Giovanni De Angelis
Istituto Superiore di Sanita (ISS), Italy, gianni.deangelis@iss.it

PLANETARY AND INTERPLANETARY PARTICLE RADIATION ENVIRONMENTS

Abstract

In this paper the current state-of-the-art knowledge about ionizing radiation models for planetary environments is reviewed. Incoming particles, atmospheric and surface environments, radiation transport techniques, results for modeling and when available comparison with observational data are discussed. These models allow obtaining radiation dose and dose rates for different interplanetary mission scenarios, composed of at least one out of three main segments, namely the launch and the interplanetary cruise phase, the planetary approach /departure and orbit insertion/escape phase, and the planetary surface phase. For each individual phase the respective radiation environment is taken into account, along with its variations with time. Examples are shown for the Moon, Mars and its moon Phobos, and the Jupiter system, for both manned and unmanned mission scenarios. These models are currently used in mission studies as well as in spacecraft and planetary surface vehicle development.