

0.1 High level goals

0.2 Mission drivers

Given the nature of the mission, being JUNO an interplanetary mission starting from a distance of around 1 AU, with an nominal distance from the sun of 5.2 AU, and operating in an highly radiation intense environment, the following drivers have been identified:

1. Provide enough electricity during the duration of the mission

The journey of JUNO is long and passes through different zones of the solar system. Solar panels were chosen to provide electric energy across the mission over a nuclear source, since it has been decided that it was better to advance technology of solar cells. The system needed is thus oversized at 1 AU with respect to the science operations needed, the radiation on Jupiter is in fact up to 97 % lower. Furthermore the science operations are scheduled to begin around 5 years into the mission, so degradation of the solar cells must be taken into account. INSERIRE RIFERIMENTI: VIDEO, SLIDES LAVAGNA, JUNO Mission

2. Provide the correct temperature range across the instruments during operation and the journey

The delicate suites of instrument present onboard JUNO require a very narrow range of temperature to operate, as low as 1 K. The MWR instruments in fact need is to measure with high accuracy the microwave emission from Jupiter. During the cruise phase JUNO will pass as close as 0.88 AU from the Sun, so the S/C will need to protect the p/l from the incoming heat. Passive solutions are preferable to maintain simplicity and reliability during the whole mission period.

3. Shield the instruments from the radiation of Jupiter

0.3 Functional analysis

0.4 Main mission phases

0.5 ConOps

0.6 Payload analysis

0.7 Mission analysis