# The thermal challenge of the MICROSCOPE experiment

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To observe any violation of the Equivalence Principle at a level as low as $10^{-15}$, the MICROSCOPE experiment tests in orbit the universality of free fall with two pairs of masses made of different materials. The room temperature experiment requires a very high resolution of the electronics units that will manage the electrical fields surrounding the masses as well as a very high stability of the mechanical core of the instrument. The quasi-circular heliosynchronous orbit manages the satellite fixed oriented to the sun, without eclipse, to the benefit of the temperature skin conditions. The instrument accommodation includes three thermal shields separating the units according to their sensitivity to temperature fluctuations and to their own power consumption. Radiation pressures, radiometer effects, out-gassing and thermal expansion of the masses must not disturb their inertial motions in the Earth gravity field and the electrical voltages applied on the electrodes all around the masses must be very stable as well, in order to detect any violation signal. Models and experiments have been performed to optimise the definition of the instrument and its satellite thermal case which will be produced in the following year. The major contributors to the mission performance are evaluated in regard also to the mission scenario which considers several calibration phases of the instrument.