

New Characterization of the PMO6V Radiometer of VIRGO/SoHO

Claus Fröhlich [cfrohlich@pmodwrc.ch], Davos Wolfgang, Switzerland

The results of a detailed thermal model of the aperture and the corresponding heating has provided new insight into the behaviour of the PMO6V radiometer. The model results are compared to the air-to-vacuum measurements of the SOVIM radiometers (2001-2003) for the SOLAR experiment on the International Space Station, and also to some newer measurements of VIRGO-2 (from the spare VIRGO experiment) at PMOD (1994, 2003-2008) and those at the TRF facility at LASP (July 2009). These results are used for a new characterization of the PMO6V type radiometer in air and vacuum. For the application of the radiometers in air the question is whether the heat transport is by conduction or convection. The small temperature differences within a radiometer and the absence of an orientation dependence of the sensitivity during solar measurements on a solar tracker suggest that convection may be not important. This is confirmed by comparison of the results of the thermal model with the results from characterization experiments. They also allow us to determine the performance in vacuum (in space). Together with my earlier characterization of DIARAD – the absolute value of the VIRGO TSI record can be determined. Moreover, the model together with the behaviour of the oxide (Cr₂O₃) on the stainless steel aperture under strong UV radiation in space explains the early increase and provides also a method to treat aperture heating in the covered operation of the PMO6V radiometers.