

**THERMAL ANALYSIS OF THE MECHANICAL STRUCTURE OF  
THE SOLAR TELESCOPE GREGOR**

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**ABSTRACT** The optical telescope *GREGOR* is a new, modern telescope for solar and stellar research on the Canary island of Tenerife. It is designed for high-precision measurements of the magnetic field and the gas motion in the solar photosphere during daytime and for high resolution stellar spectroscopy during the night.

In this paper the thermal analysis of the mechanical structure of the sun telescope *GREGOR* will be presented. In particular the modeling and simulation of the radiation heat transfer between the sky and the sun telescope and between the different structural parts of the telescope will be investigated. The superposition of the heat conduction, the radiation heat transfer and the convection will be analyzed to maintain a minimal temperature deviation of the telescope structure to the ambient air in order not to introduce thermal inhomogeneities of the telescope structure. Due to the subjection of the telescope to the sun radiation the thermal influences which may result into a worsening of the pointing and into a possible internal seeing have to be minimized by passive means. The aim of this thermal analysis is to verify that the telescope meets the required operational temperature specifications with the developed passive sun protection arrangements for the telescope structure.