



STEREO/WAVES antennas calibrated by AKR

M. Panchenko (1), H.O. Rucker (1) W. Macher (1), B. Cecconi (2), T.H. Oswald (1), G. Fischer (1)

(1) Space Research Institute, Austrian Academy of Sciences, Schmiedlstrasse 6, Graz, 8042, Austria, (mykhaylo.panchenko@oeaw.ac.at). (2) LESIA, Observatoire de Paris, Meudon, France.

Abstract

The antenna system of the WAVES experiment on-board STEREO (Solar TERrestrial Relations Observatory) consists of three 6-m long orthogonal monopoles designed to measure the electric component of the radio waves. It is generally known that effective electric axes and lengths of the antennas (effective length vectors) do not coincide with the physical rods due to the distortion of the antenna reception properties, caused by interaction with other electric devices and spacecraft structures. We present the results of the in-flight calibration of the STEREO/WAVES antennas using the observations of the non-thermal terrestrial Auroral Kilometric Radiation (AKR) during STEREO roll manoeuvres. The effective length vectors of the electrically short antennas ($2L \ll \lambda/2$) have been determined by fitting of the model-predicted temporal variations of the normalized autocorrelations and cross-correlations to the measured signals. The obtained results are compared with antenna effective length vectors evaluated by methods of rheometry and wire-grid numerical simulation.

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