

A POTENTIAL NEW METHOD FOR MEASURING THE SOLAR DIAMETER CHANGES WITH TIME DISTANCE HELIOSEISMOLOGY

A.V. Serebryanskiy¹ and Sh.S. Kholikov¹ and GONG team

¹*National Solar Observatory, Tucson, AZ, US*

We present a new possibility of measuring the solar diameter change using multiple bounce time-distance analysis. We show that the 2D cross-correlation function can be used to investigate travel time and path length changes to separate the effects of sound speed and travel distance perturbations. We can interpret the travel distance perturbation as the results of solar radius change. This method can be used to search for solar radius changes associated with solar activity or for comparison between observed solar radius and that used in solar models. We also present an estimate of the accuracy of the method and some preliminary results obtained with GONG low-resolution images for the period 1996-1997 which corresponds to the minimum of solar activity.

This work utilizes data obtained by the Global Oscillation Network Group (GONG) Program, managed by the National Solar Observatory, which is operated by AURA, Inc. under a cooperative agreement with the National Science Foundation. The data were acquired by instruments operated by the Big Bear Solar Observatory, High Altitude Observatory, Learmonth Solar Observatory, Udaipur Solar Observatory, Instituto de Astrofisico de Canarias, and Cerro Tololo Interamerican Observatory.

Serebryanskiy A.V. supported by grant of NSF-NATO Postdoctoral Fellowship in Science and Engineering for Scientists from NATO Partner Countries.

Preferred presentation: Poster