VIRGO Science Proposal D9
Inversion of the solar core structure

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Objectives

We propose a joint analysis of the MDI, VIRGO, GOLF data which consists in combining their frequencies and inverting them to infer the structure of the solar core.

Scientific rationale

It comes out from the inversion of the IPHIR, BISON and LOWL frequencies that the structure of the solar core is still a controversial issue. We would like to take advantage of the frequencies of the very low-degree low-order p modes and possibly g modes that VIRGO and GOLF will provide by combining them with the SOI frequencies to infer the structure of the solar core.

Work plan

A regularized least square inversion code of the p- and g-modes frequencies is under developement in Nice. This code approximates the functions to be inferred by piecewise polynomials projected on B-splines of arbitrary order.

We are studying how to take advantage of the properties of B-splines mainly for improvement of the regularization procedure, and the description of rapid variations in the solution. In particular, we will test the influence of the form of the regularizing terms on the inversed structure and the influence of the surface effects.

A wide range of solar models, provided by P. Morel with his code CESAM of stellar evolution, will be used on that purpose.

Problem areas

See above.

Responsibilities

To be defined