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Diffusion near solar core

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Abstract.

Qualitative reasoning leads to the conclusion that taking into account a proper diffusion process would provide a non-standard solar model (NSSM) giving smaller neutrinos fluxes and being compatible with helioseismology data. The actual theory of the diffusion process is not approached in the present paper. It is just mentioned that a phenomenological representation of the macroscopic diffusion process by a gaussian, having its maximum D_0 (of the order of $10^3\,\mathrm{cm}^2\,\mathrm{s}^{-1}$) at a distance R_0 (of the order of $0.2R_\odot$) of the solar center and a half-width $R_\odot\sigma$ (of the order of $0.04R_\odot$) is acceptable. This phenomenological representation can be improved including in the complete description the microscopic diffusion coefficient. The present numerical experiment appears to show that it is, possible to decrease appreciably the difference between observational data and NSSM.

Key words: Diffusion - Methods : numerical - Sun : oscillations - Sun : particule emission

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