

PRAESEPE: NO EVIDENCE FOR SOLAR MIXING

(Abstract)

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Sagan and Young (1973) have claimed that the spread in the main sequence of Praesepe, which is greater than can be accounted for by observational error, is evidence for episodic mixing of the kind expected on the Dilke-Gough (1972) mechanism for solving the solar neutrino problem. I wish to make two points:

(1) It has been known for some time that the main sequence spread in Praesepe and other clusters can be accounted for by the observed spread in rotational velocities of the stars in the clusters, if the stars are not uniformly rotating. The spread is therefore no evidence for episodic mixing.

(2) As noted by Sagan and Young themselves, the observed distribution of stars in the main sequence band is nearly uniform. This is *not* expected from episodic mixing; if stars mix for only 1/50 of their lifetime, only two per cent of the stars should be displaced from the main sequence which means maybe one star in Praesepe. However, the observed uniform spread is nicely consistent with the observed relatively flat distribution of rotational velocities.

References

- Dilke, F. W. W. and Gough, D. O.: 1972, *Nature* **240**, 262.
Sagan, C. and Young, A. T.: 1973, *Nature* **243**, 459.