

in Fig. 2. A non-rotating main sequence is shown along with ones with two different values of $M\Omega$ and the evolutionary tracks for sequence B. In a cluster of stars similar to the Sun one might expect to find stars scattered throughout the region between the non-rotating main sequence and one of the rotating ones. A typical spread at a given T_e is 0.2 to 0.3 in $\log L$. This spread of 0.75 mag is not observed in Praesape¹⁴, for instance.

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Oblateness of solar models with rotating cores

ROOD and Ulrich¹ have discussed the oblateness of solar models with a rotating core. They find a larger oblateness for the same model than we did². We have looked again into the oblateness calculation and now believe that the correct solution of the equations of Goldreich and Schubert³ gives an oblateness for the final model of our² sequence C4 in agreement with the value derived by Rood and Ulrich. We also agree with Rood and Ulrich's explanation for the discrepancy.

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Geomagnetism and the tropospheric circulation

IN a recent article in *Nature*¹, King draws attention to certain similarities between the atmospheric flow pattern in mid-troposphere and the Earth's magnetic field. He postulates "some unknown magnetic-field dependent mechanism" which exerts a control on the tropospheric circulation and associated atmospheric pressure field. The evidence on which he bases this idea consists of the similarity between the distribution of the height of the 500-mbar pressure surface in the atmosphere and that of the geomagnetic field strength, particularly in latitude 60°. He supports this with some indication that the features of the 500-mbar surface have moved westwards in parallel with the features of the geomagnetic field.

The purpose of this communication is to point out that it is unnecessary, and probably misleading, to postulate any causal relationship between the geomagnetic field and the 500-mbar contours, because the main features of the maps of 500-mbar contours can be explained by direct calculation from physical and dynamical principles without consideration of magnetic effects. Moreover any westward movements of the features of the

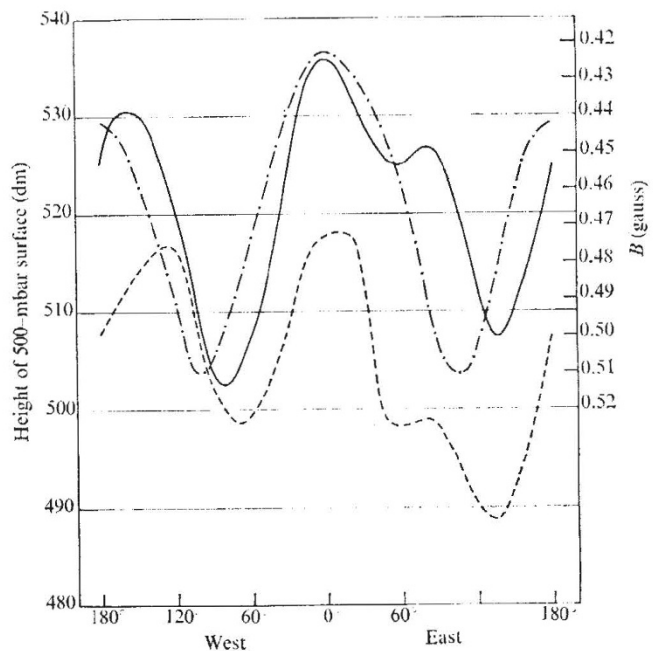


Fig. 1 Longitudinal variation of 500-mbar height and magnetic field strength along latitude 60°N in January. — Observed 500-mbar height from ref. 6; --- dynamically computed 500-mbar height; - · - · - magnetic field strength from Fig. 2 of ref. 1.

500-mbar height field appear to be merely the result of temporary fluctuations, and therefore unlikely to be linked with the westward motion of geomagnetic features which has continued over a century or more.

In recent years a great deal of effort has been devoted to the numerical solution of the equations of motion of the atmosphere, together with the thermodynamic equations, equations for radiative transfer and the mathematical representation of the other physical processes in the atmosphere. Given the external heat sources—the solar radiation—and appropriate thermal and mechanical boundary conditions at the Earth's surface, the aim has been to calculate the global atmospheric circulation and such related features as the distribution of temperature and pressure. The atmospheric circulation is far from being steady,