# Modeling Solar Cycle Related Variation Inside the Sun

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We construct the solar models including the effects of variable magnetic fields and rotation. The configurations of magnetic fields in the solar interior related solar cycle are obtained by using a Babcock-Leighton (BL) type flux transport dynamo model. We find that the solar models can reproduce the basic cyclic changes in the solar interior. Under helioseismic constraints, modeling the significant change in sound speed with solar activity, the critical field of strength necessary is $B_{c}=4.0/times 10^{5}$ G. The result indicates that helioseismic techniques might be a useful method by which we can probe and measure the toroidal field generated at the tachocline. In addition, we find that the observed frequency shifts might be caused by the near surface direct perturbations of the poloidal fields. Although the axisymmetric kinematic model is simplified approximation, it made great progress in the explanation of cyclic variations of solar structure.
The proposed models can help us better understanding of active solar-like stars which share similar dynamical properties with the Sun.