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Abstract for an Invited Paper  
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### **Solar dynamo modeling and prediction<sup>1</sup>**

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Global-scale solar dynamo models have evolved significantly over the past half century. The model that can most successfully reproduce many global solar cycle features is the so-called 'flux-transport' dynamos. Along with the differential rotation (Omega-effect) and helical turbulence (alpha-effect), another important ingredient in this class of models is the meridional circulation, which works as a conveyor belt and governs the dynamo cycle period as well as the memory of the Sun's past magnetic fields. After describing the physical processes involved in a flux-transport dynamo, we will show how a predictive tool can be built from it that can be used to predict mean solar cycle features by assimilating magnetic field data from previous cycles. We will present our timing and amplitude predictions for upcoming cycle 24. We will close by discussing the sensitivity of our model in predicting N/S asymmetry in solar cycles.

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