How Well Can We Predict Solar Cycle 35?

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Solar Cycle 24 has faded and signs of Solar Cycle 25 are appearing at the solar surface. The number of active regions of the new cycle will begin a rapid rise next year. We have learned much about predicting solar activity in Solar Cycle 24, especially with the data provided by SDO and STEREO. Short-term predictions of solar flares and coronal mass ejections have benefited from applying machine learning techniques to the new data. Mid-range predictions like the arrival times of coronal mass ejections have benefited from a steady flow of data from SoHO, STEREO, and SDO. Longer-term (greater than a year) predictions of solar activity have benefited from helioseismic studies of the plasma flows in the Sun. But predictions made long before the next cycle begins still rely on precursors. I will describe the prediction of the SODA polar field precursor method, which has accurately predicted the last three cycles, for Solar Cycle 25. I will also describe our understanding of the polar regions of the Sun --- the seeds of the next cycle. Some ideas on even longer-term predictions will be presented. These predictions are limited by the growth of the forecast error, which increases until a simpler forecast becomes more accurate. Versions of the climatological average forecast are examples of the simpler forecast.