太陽表面磁場を用いた次期太陽周期活動度予測

＃飯島 陽久 [1]; 今田 晋亮 [2]; 堀田 英之 [3]; 草野 完也 [4]; 塩田 大幸 [5]
[1] 名大 ISEE; [2] 名大・ISEE; [3] 千葉大; [4] 名大ＳＴＥ研; [5] 名大宇宙地球研

Predicting the Next Solar Cycle from the Photospheric Magnetic Field

Haruhisa Iijima[1]; Shinsuke Imada[2]; Hideyuki Hotta[3]; Kanya Kusano[4]; Daikou Shiota[5]
[1] ISEE, Nagoya Univ.; [2] ISEE, Nagoya Univ.; [3] Chiba Univ.; [4] STEL, Nagoya Univ.; [5] ISEE, Nagoya Univ.

Prediction of the solar cycle amplitude is an important task to know the future space weather environment in the time-scale over several years. One successful prediction method is precursor method where the photospheric magnetic field in the polar region at the solar cycle minimum is used as a precursor of the amplitude of the next solar cycle maximum. The high correlation between the precursor and the strength of the next cycle is found at least in the past 100-years. The precursor method allows us to predict the solar cycle amplitude 5–6 years before the solar maximum.

Our next step for the solar cycle prediction is to predict the polar field strength at the solar minimum several years before the minimum. The Surface Flux Transport model (SFT) is a model to describe the evolution of the solar surface magnetic field. Recently, the prediction of the polar field by the SFT is reported in several studies. However, this model has a large uncertainty on the modeling of the new emergence of the sunspots. We investigate the contribution of the new emergence of the sunspots on the polar field prediction based on the observed magnetogram in the last four solar cycles. We find that the contribution of the new sunspots becomes very small in the period of several years before the each solar cycle minimum. The result indicates that the current polar field strength in 2017 can be used as a precursor of the next solar cycle. Based on the findings, we suggest that the next solar cycle will be similar or slightly weaker than the current cycle.