
PEM021-19

Room: Function Room A

Time: May 24 15:30-15:45

Current status of dynamo theory and perspective toward cycle 24

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Although the solar activity is finally increasing, the current solar minimum looks especially low at least in comparison with the last several cycles. If we can clarify the differences of this solar minimum from the others observationally, it may bring new insight into the dynamo mechanism. However, dynamo theories still have fundamental uncertainty and difficulties. We are not in a stage where one or two key observations can make a breakthrough. Recently there are some attempts to predict the sunspot number in the next cycle, using the so called flux transport dynamo model. However, predictions by different research groups for cycle 24 did not agree at all. Now the activity of solar cycle seems to be low, but one should be careful to draw a conclusive judge on which model describes the correct physics of the dynamo process. The current status and future perspective of the dynamo study will be discussed.

Keywords: dynamo, solar cycle