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[Abstract]

Sunspot Activity in Solar Cycle 24 from Istanbul University Observations

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Abstract: This study presents a preliminary analysis of sunspot activity during the 24th Solar Cycle based on daily observations conducted at Istanbul University Observatory. Since 1951, systematic sunspot observations have been carried out using the University's historical meridian telescope, resulting in one of Turkey's most extensive long-term solar observation archives. The data used in this analysis were compiled from daily records maintained by researchers at the Department of Astronomy and Space Sciences. Butterfly diagrams were constructed to investigate the latitudinal distribution of sunspot groups. As in previous cycles, a clear north–south asymmetry was identified. In particular, sunspot groups in the southern hemisphere were found to cover a broader range of latitudes compared to those in the northern hemisphere. Moreover, the time series based on monthly averaged relative sunspot numbers reveals a distinct double-peaked maximum phase in Cycle 24, a characteristic also observed in Cycles 22 and 23, but more pronounced in the current cycle. These initial findings highlight the dynamic structure of the solar cycle and reflect the complexity of the Sun's magnetic field evolution. They also

emphasize the scientific value of Istanbul University's long-term observational data for contemporary solar physics research.

Keywords: Solar activity, Solar observations, Butterfly diagram, Long-term monitoring, Solar Cycle 24