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## Characteristics of solar differential rotation and activity during solar cycle No. 24

We present results of the behaviour of the solar differential rotation during solar cycle No. 24 derived from the Kanzelhöhe data set (Kanzelhöhe Observatory for Solar and Environmental Research, University of Graz, Austria). Sunspot groups and their properties (umbra, penumbra, size, and position) were identified by morphological image processing of Kanzelhöhe white light images for the time period 2009–2020. Kanzelhöhe Observatory prepares this data every observing day, and it is accessible via the FTP server. The sample was limited to  $\pm 58$  deg in the central meridian distance (*CMD*) to avoid solar limb effects leading to high position uncertainties. We used two different methods to calculate the sidereal angular rotation rate  $\omega$  and subsequently the solar rotation parameters *A* and *B*: a daily shift method, where the synodic rotation velocities were calculated from the daily differences of the *CMD* and the elapsed time, and a robust linear least-squares fit method, where synodic rotation velocities were calculated by fitting a line to the measured positions in time *CMD*(*t*) for each tracer, for at least three consecutive measurements. We determined the dependence of the parameters *A* and *B* on the solar activity using the yearly mean total sunspot number obtained from the Sunspot Index and Long-term Solar Observations (SILSO). For the first time, the whole solar cycle No. 24 is examined using the Kanzelhöhe data set.

**Primary authors:** LONČARIĆ, Klaudija (University of Rijeka, Faculty of Physics, Croatia); POLJANČIĆ BELJAN, Ivana (University of Rijeka, Faculty of Physics, Croatia); MIHOJEVIĆ, Tomislav (University of Rijeka, Faculty of Physics, Croatia); JURDANA-ŠEPIĆ, Rajka (University of Rijeka, Faculty of Physics, Croatia); PÖTZL, Werner (Kanzelhöhe Observatory for Solar and Environmental Research, University of Graz, Austria); BRAJŠA, Roman (Hvar Observatory, Faculty of Geodesy, University of Zagreb, Croatia); VERONIG, Astrid M. (Kanzelhöhe Observatory for Solar and Environmental Research and Institute of Physics, University of Graz, Austria); HANSLMEIER, Arnold (Institute of Physics, University of Graz, Austria)

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