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Rotational velocity of the solar corona versus solar activity

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This contribution describes the procedure by which we found relationship between the rotational velocity of the solar corona and the level of the solar activity (phase of the solar cycle) in the period of 2011 - 2020. The deviation of the speed from the mean value is ± 0.0239 °/day, which corresponds on the solar surface near the equator to ± 3.16 m/s, with a mean value of about 14.1 °/day (1864.3 m/s). The level of activity was determined using the coronal index (CI) and we used the data on coronal rotational velocity from our recent work (Dorotovič and Rybanský, 2019). The correlation coefficient between the monthly averages of the CI and the rotational velocity during the given period (120 months) is 0.752. We did not find theoretical explanation for this phenomenon.

Reference: Dorotovič, I., Rybanský, M. Rotation of Some Solar Coronal Bright Features as Derived from the Solar Dynamics Observatory/Atmospheric Imaging Array (SDO/AIA) 21.1 nm Images (for the Years 2011 – 2018). Sol. Phys. 294, 109 (2019). <https://doi.org/10.1007/s11207-019-1501-z>

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