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## Diagnosics of turbulent component of solar dynamo in the convective zone from the morphology of strong-flaring active regions

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To find out observational evidences for the turbulent component of the solar dynamo in the convective zone is a very challenging problem because the dynamo action is hidden below the photosphere. Here we present results of a statistical study of active regions (ARs) with strong flares ( $>X1.0$ ) occurred during the 23rd and 24th solar cycles. A suggested magneto-morphological classification of ARs allowed us to diagnose the degree of intervention of the turbulent (mid-scale and small-scale) component of the dynamo. We found that in 72% of cases, the strong-flaring ARs do not comply empirical laws of the global dynamo (the Hale polarity law, the Joy's law, the leading spot prevalence rule; ARs-"violators") and therefore they may be attributed to the influence of the turbulent dynamo action inside the convective zone on scales of typical ARs. We found that strongest flares occur in the ARs-"violators", so the flaring capability of the Sun is controlled by the turbulent component of dynamo. ARs-"violators" with strongest flares tend to happen during the second maximum and the descending phase, when the toroidal field ceases and the turbulent component of the dynamo should be more pronounced. These observational results are in consensus with a concept of essential role of non-linearity and turbulent intermittency in the magnetic fields generation inside the convective zone, which follows from simulations of dynamo.

### Student poster?

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