Self-organized theory model of Solar flares: New frontiers from small-scale structures
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A further development of Solar flares model based on Self-organized critical (SOC) theory worked out by the authors is presented.

It is shown, that models based on SOC - theory approach to the study of rapid energy dissipation in magnetic plasma may be of equal importance with the localized, small-scale Magnetohydrodynamic (MHD) simulation. However refined SOC models are needed to establish a more physical connection between the model evolution rules and the observations.

The authors present a new model in the frame of which not only statistical results, but also basic for the model elements and processes, such as magnetic tubes are matched against the observational data. This approach allows further development of the model by introduction of specifications corresponding to a more refined physical image of the phenomenon.

We show that:
i) continuous emersion and interactions (dissipation, reconnecting) of the tubes may occur as a self-organized criticality process, producing avalanches;

ii) By taking into account flares inertia, we can construct and explain the flares statistic indices variation.

iii) The model allows to determine certain physical parameters for small-scale magnetic tubes. This result is unusual for stochastic models.

iv) we used the system that builds its own spatial structure, similar different polarity zones on the Sun. The zone that divides them (the one, we might call "the neutral line") proves to be, like in the case of the physical Sun that of flares generation and of maximal energy output.

Key Words: Self-organized critical (SOC) theory, Solar flares, stochastic model