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On the Role of Type-II Spicules in Heating and Replenishing the Solar Corona with Hot Plasma

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Heat fluxes from Type II spicules into the surrounding corona as a possible source of corona heating are determined. We have shown that in order to compensate for radiation and thermal conduction losses, approximately 10^4 hot Type-II spicules are required, which is about 1% of the number of spicules simultaneously observed on the solar disk. The main driver for coronal heating is the convective motion of the photosphere which creates emf. The emf supports the electric current in the Type II spicule and the dissipation of the current in the partially ionized plasma heats the spicule to the temperature > 1 MK. Arguments in favor of Type-II spicule as an open magnetic flux tube are given. The analysis shows also that Type-II spicules play an important role in the replenishing the solar corona with hot plasma.

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