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Induced emission of Alfvén waves – the missing source of solar corona heating and solar wind acceleration VITALY GALINSKY, VALENTIN SHEVCHENKO, UCSD — The solar corona is considerably hotter than Sun's surface or photosphere. However, the mechanism that heats it to millions of degrees is still under debates. Recent observations revealed presence of the ubiquitous outward-propagating Alfvénic motions with amplitudes up to 25 km s^{-1} and periods of the order of 100–500s throughout the quiescent atmosphere, thus suggesting the possible source of energy for acceleration of the fast solar wind and heating the quiet corona. Nevertheless, the challenge remains to understand how these waves are dissipated in the solar atmosphere, and how that dissipation delivers energy to the ions and electrons that comprise the coronal plasma and solar wind. Here we report a method that extends and extrapolates these observational data up to the level suitable for constraining and verification of heating and acceleration models. The macro-scale instability of the marginally stable particle distribution function compliments the resonant frequency sweeping dissipation of transient Alfvén waves by their induced emission in inhomogeneous streaming plasma that provides enough energy for keeping the plasma temperature decaying not faster than r^{-1} – in close agreement with *in situ* heliospheric observations.

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