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Free energy available to microinstabilities in the solar wind[1] EMILY LICHKO, KRISTOPHER KLEIN, Univ of Arizona, PARKER SOLAR PROBE SWEAP AND FIELDS SCIENCE TEAMS TEAM — In the solar wind we observe that there is a significant amount of power in high-frequency waves. In the current picture of weakly-collisional plasma turbulence, energy can be transferred to these waves through microinstabilities generated by non-equilibrium features in the velocity distribution functions of the constituent particles. However, it is an open question how much energy in these features is truly available to drive these waves and eventually heat the plasma. In this work we develop an ansatz to quantify the amount of free energy available to microinstabilities that can actually go into heating the plasma relative to other dissipation mechanisms. We apply this metric to a number of electrostatic test cases, and plan to apply the metric to Parker Solar Probe observations of electron distributions and Langmuir waves. Ultimately this metric will be applied to simulations of electromagnetic instabilities as well, and modified to account for the role of multiple types of microinstabilities and sources of free energy.

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