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Evidence of large-scale quantization constant in plasmas

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We identify a phase-space minimum *hin space plasmas that connects the energy of correlated plasma particles to an equivalent wave frequency. In particular, while there is no a priori reason to expect a single value of* h**across plasmas, we find a very similar value of *h** ≈ (7.5±0.3)×10ˆ-22 J·s using several independent analytical and statistical methods: 1) solar wind plasma measurements, 2) various space plasmas typically residing in stationary states out of thermal equilibrium and spanning a broad range of physical properties, 3) the entropic limit emerging from statistical mechanics, 4) waiting-time distributions of explosive events in space plasmas. Finding a quasi-constant value for the phase space minimum in a variety of different plasmas, similar to the classical Planck constant but 12 orders of magnitude larger, may be revealing a new type of quantization in many plasmas and correlated systems more generally.

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