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Kelvin-Helmholtz turbulence within reconnection exhausts in the solar wind

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Kelvin-Helmholtz (KH) instability driven by velocity shears can grow at boundaries separating both neutral fluid and plasma flow regimes. This instability is of great importance to understand interactions and mixing of fluids/plasmas separated by unstable sheared boundaries. In space plasmas, KH instability is commonly observed at the boundary layers of planets, in solar prominences, at the boundaries of rising coronal mass ejections and in the solar wind. Secondary instabilities, or even interactions between them, may play a crucial role hastening the transition from KH unstable boundary to fully developed turbulence. We investigate single spacecraft observations of the
spectral features of KH turbulence and the associated heating of the background plasma within reconnection outflow boundaries in the solar wind. We show that despite the complicated nature of KH turbulence, with presumably secondary instabilities involved, we observe statistical features of anisotropic turbulence predicted by phenomenological models.

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