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Hunting for reconnection and energy exchange sites in 3D turbulent outflows

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Plasma turbulence is typically characterized by a preferred directon, that of teh magnetic field. Most plasmas have a coherent average field component and turbulence develop over it. Tokamaks are teh archetypical case with their strong toroidal field. But also solar arcades, solr wind, magnetospheres and ionospheres have that same property. We consider here turbulence in 3D reconnection outflows. Reconnection often has a gudie field to begin with, but even without it, in the outflow there is a significant field residual from the process of reconnection. This macroscopic field organizes the plasma turbulence to form a very anistotropic state. We recenlty, investigted the properties of turbulence at different locations [1]. We deploy now innovative machine learning tools to investigate the outflows and detect the presence of secondary reconnection sites and regions of energy exchange.

[1] Lapenta, G., et al. "Local regimes of turbulence in 3D magnetic reconnection." *The Astrophysical Journal* 888.2 (2020): 104.

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