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Turbulence generated by reconnection jets collision, a numerical study

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The formation of turbulence in magnetic reconnection outflows of space plasmas has been recently ascertained by spacecraft observation, showing a good comparison with numerical simulations. In this work we study the turbulence that develops through the collision between two counter-propagating reconnection outflows each one coming form a different reconnection site in the presence of a strong guide field. We show the results of a 3D particle in cell (PIC) simulation with kinetic ion and electrons, spacial resolution equal to the electron inertial length and not realistic mass-ratio (mi/me =256).
When the two jets approach each other a secondary current sheet forms between the two causing a secondary reconnection event. After this phase several new current sheets forms in the outflows giving rise to a turbulent regime. We study the properties of this turbulence by means of spectral analysis. We present as well a method by which the turbulent region can be singled out from the whole simulation domain and studied separately from the non turbulent one.