SIMULATING LANGMUIR TURBULENCE WITH SPECTRAL METHODS: APPLICATIONS TO POWER SPECTRA PARAMETERIZATION

Hernández Francis[1], Ramirez Joseph[2], Rojas Enrique[3]

[1]Federico Villarreal National University, [2] Pedro Ruiz Gallo National University, [3] Cornell University

Abstract:

Eliasson and Thidé [1], simulated Langmuir turbulence to model the spectra obtained by SEE. To carry out this simulation, they used an extended Zakharov system of equations, solved it with finite volume methods, and built the power spectra of the electric field's time series. This enables them to map simulation parameters to spectral width. Following their approach, we simulated Langmuir turbulence to obtain its properties and characteristics using spectral methods, which are potentially faster than finite volume methods for this type of system [2]. We used this acceleration to do a more comprehensive mapping between simulation parameters (length scale, collision frequency, pumping wave, and Landau damping rate) and the main features of the power spectra.

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References:

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