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Instability modeling of homogenous and inhomogeneous plasmas using nonparametric distribution estimation and convex vector optimization algorithms SAM ADHIKARI, Sysoft, R&D Division of Integratsie Inc. — Due to departure from thermodynamic equilibrium, plasma instabilities are difficult to model. Velocity distributions in homogenous plasma and associated kinetic energies are modeled and simulated using nonparametric distribution estimation algorithms. The magnetic field and the spatial inhomogeneities for inhomogeneous plasmas are also modeled using vector optimization algorithms. Bounding probabilities and expected values provide excellent results for homogenous plasmas. Scalarization algorithms for Pareto optimization in inhomogenous plasmas are used. The problem eventually turns into a multicriterion vector optimization problem.

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