

Abstract Submitted  
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**A Drift-Kinetic Method for Obtaining Gradients in Plasma Properties from Single-Point Distribution Function Data**<sup>1</sup> BLAKE WETHERTON, University of Wisconsin - Madison, Los Alamos National Laboratory, JAN EGEDAL, PETER MONTAG, University of Wisconsin-Madison, ARI LE, WILLIAM DAUGHTON, Los Alamos National Laboratory — We derive a new drift-kinetic method for estimating gradients in the plasma properties through a velocity space distribution at a single point. The gradients are intrinsically related to gyrotopical features of the distribution function. This method predicts the gradients in the magnetized distribution function, and can predict gradients of arbitrary moments of the gyrotopical background distribution function. The method allows for estimates on density and pressure gradients on the scale of a Larmor radius, proving to resolve smaller scales than any method currently available to spacecraft. The model is verified with a set of fully-kinetic VPIC particle-in-cell simulations.

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