

Abstract Submitted  
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**Vlasov-Fokker-Planck Transport Simulations Of Magnetic Field Instabilities** ALEXANDER THOMAS, Imperial College, CHRISTOPHER RIDGERS, ROBERT KINGHAM — Strong magnetic fields are well known to significantly affect the transport properties of plasmas. In addition to being externally applied, these can be self-generated spontaneously through non-linear processes. Magnetic field generating instabilities include thermomagnetic and pressure anisotropy (e.g. Weibel) effects. These are best described by the Vlasov-Fokker-Planck equation, in the presence of strong gradients where non-local effects are important, as is usually the case in laser-plasma interactions. We have further developed the 2-D Vlasov-Fokker-Planck code IMPACT to include terms in the cartesian tensor expansion of velocity space up to order 3. The previous code included only zero and first order terms, which are not sufficient to completely describe some of these magnetic instabilities. Analytic and numerical modeling of the semi-collisional regime of magnetic field generation is presented, which demonstrate spontaneous growth of magnetic fields and the effect of adding these higher order terms. We consider the ramifications of these for inertial fusion energy.

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