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Non-linear flux vortex dynamics in MoGe¹ MANLAI LIANG, MILIND KUNCHUR, JAMES KNIGHT, University of South Carolina, JIONG HUA, ZHILI XIAO, Argonne National Laboratory — In the limit of small magnetic and electric fields, and low current densities, free flux flow in the mixed state leads to an Ohmic response. A number of interesting non-linearities can arise during free flux flow when it is pushed to high values of these parameters, because of changes in the quasiparticle distribution function or temperature (principally at high electric fields), and pair breaking due to the current or magnetic field. Usually pinning obscures these regimes so that the current density and magnetic field required to overcome pinning is such that the system is already out of the linear response range. MoGe has an uncommonly low level of pinning, which allows one to clearly observe the linear response regime without invoking near pair-breaking magnitudes of the parameters. We have studied the vortex stability in this system and also observe a superlinear magnetic field dependence that seems to arise from magnetic pair breaking.

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