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**A Preformed Pair Approach to Diamagnetism in the Cuprates** VIVEK MISHRA, DAN WULIN, K. LEVIN, James Franck Institute, University of Chicago — Enhanced diamagnetism extending beyond the critical regime is associated with the pseudogap. It has been one of the key experiments supporting the precursor superconductivity scenario for this normal state gap. In this talk we demonstrate how non-condensed pairs (rather than normal state vortices) yield a large low field diamagnetic signal. Our work is based on a 3d BCS-BEC crossover scenario where the diamagnetic susceptibility calculation is well controlled and built on a sum-rule compatible correlation function approach. We demonstrate reasonable semi-quantitative agreement with experiment, with no adjusted parameters.

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