

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Crucial Role of Internal Collective Modes in Underdoped Cuprates**<sup>1</sup> AABHAAS V. MALLIK, UMESH K. YADAV, Indian Institute of Science Bangalore, AMAL MEDHI, Indian Institute of Science Education and Research Thiruvananthapuram, H. R. KRISHNAMURTHY, VIJAY B. SHENOY, Indian Institute of Science Bangalore — The enigmatic cuprate superconductors have attracted resurgent interest with several recent reports and discussions of competing orders in the underdoped side. Motivated by this, here we address the natural question of frailty of the  $d$ -wave superconducting state in underdoped cuprates. Using a combination of theoretical approaches we study a  $t - J$  like model. We report an – as yet unexplored – instability that is brought about by an “internal” fluctuation (anti-symmetric mode) of the  $d$ -wave state. This new theoretical result helps in understanding recent ARPES and STM studies. We also suggest further experiments to uncover this physics.

<sup>1</sup>Work supported by CSIR, UGC, DST and DAE

Aabhaas V. Mallik  
Indian Institute of Science Bangalore

Date submitted: 06 Nov 2015

Electronic form version 1.4