

# Probing longitudinal and transversal correlations with non-uniform current distributions

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## Abstract

We report on transport measurements in the mixed state of the high temperature superconductor YBaCuO. We have studied the vortex dynamics and correlations in the solid and liquid phase of clean (untwinned) crystals in presence of non-uniform current distributions. These currents apply non-uniform forces to the vortex system providing a unique tool to detect the transversal and longitudinal rigidity of the different vortex phases. In particular, the evolution of the vortex shear rigidity during the solidification process can be detected. The influence of surface barriers on our transport measurements will be discussed.