

**Thermal conductivity measurements  
near  $T_\lambda$  of  $^4\text{He}$  in restricted geometries**

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We present measurements of thermal conductivity  $\lambda(t, L)$  of  $^4\text{He}$  near its superfluid transition at saturated vapor pressure and confined in different 2 mm thick glass capillary plates consisting of parallel micro channel arrays with rectangular cross sections of (5x50) and (1x10)  $\mu\text{m}$ , respectively.

The heat current ( $2 < Q < 400$ ) nW/cm<sup>2</sup> was applied along the channel direction. High precision measurements were provided by six DC SQUID based nano-Kelvin resolution thermometers.

Our preliminary data show that thermal conductivity in two dimensional confinements is finite at the bulk superfluid transition temperature. The next step is to compare our results with those of three- and one-dimensional geometries to study the effect of confinement.

Simultaneous employment in our experiment of two different confinement sizes allows us to directly test the finite-size scaling related to the system transport properties.