Studies of $Bi_2Sr_2CaCu_2O_{8+\delta}$ in Magnetic Fields by Scanning Tunneling Spectroscopy

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Abstract

We have performed scanning tunneling spectroscopic studies of slightly overdoped $Bi_2Sr_2CaCu_2O_{8+\delta}$ (T_c=86K) single crystal in magnetic fields of 1, 4 and 10 T at 4.2K; in the area of 50nmX50nm I-V charcteristics curves (64X64=4096) have been measured at every 0.78nm spacing, expecting to observe images of vortices. However, the tunneling spectra show the same shape in the whole area and no appreciable change has not been observed in the tunneling spectra, compared with those in zero applied magnetic field. Renner *et al.* [Phys. Rev. Lett. 80 (1998) 3606] has succeeded in observing the vortices in oxygen-underdoped and oxygen-overdoped $Bi_2Sr_2CaCu_2O_{8+\delta}$. The reason of no-observation of vortices in our single crystal BSCCO sample is not known. Our STS data will be shown in the workshop.