

PROBABLE OBSERVATION OF INTERNAL PROXIMITY EFFECT IN
DIRECT MAPPING OF THE ENERGY GAP OF SINGLE CRYSTAL
BiSrCaCuO

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The tunneling conductance $G(V,x,y)$ is mapped with 5 Angstr. resolution on cleaved a - b planes of BiSrCaCuO crystals ($90\text{ K } T_c$) using scanning vacuum tunneling spectroscopy at 4.2 K. A strong, spatially varying $G(V,x,y)$, evidently arising from a superconducting gap is observed on the a - b plane. More highly peaked $G(V)$ with reduced peak spacing are seen near (approx 50 Angstr.) specific sites, and over broader areas. It is probable that the striking variations in $G(V,x,y)$ indicate local variations in BiO layer metallicity and reveal an internal superconducting proximity effect between BiO and CuO layers.

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