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1D Superconducting behavior in 4-Angstrom carbon nanotube-zeolite composite WU SHI, ZHE WANG, HANG XIE, TING ZHANG, NING WANG, ZIKANG TANG, The Hong Kong University of Science and Technology, XIXIANG ZHANG, King Abdullah University of Science and Technology, ROLF LORTZ, PING SHENG[1], The Hong Kong University of Science and Technology — We report 4-probe electrical measurements on a sample of 4-Angstrom carbon nanotubes-zeolite composite that exhibit 1D superconducting behavior. The resistance displays a smooth decrease as a function of temperature that is characteristic of the phase slip fluctuation effects, and the differential resistance measured as a function of current shows a quasigap that is characteristic of the fluctuating condensate. Both data sets show very little variation upon the application of a magnetic field, up to 9 Tesla. These behaviors are explainable in terms of the Langer-Ambegaokar-McCumber-Halperin (LAMH) theory of phase slips. We also show and discuss an interesting phenomenon in which a sharp zero current (bias) peak appears in the differential resistance above 3 K.

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