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Point-contact spectroscopy of the electron-doped cuprate superconductor $Pr_{2-x}Ce_xCuO_4$ in magnetic fields up to 32 tesla[1] SUNGHEE YUN, TARA DHAKAL, JACOB TOSADO, AMLAN BISWAS, Department of Physics, University of Florida, Gainesville, FL, BING LIANG, RICHARD GREENE, Center for Superconductivity Research, University of Maryland, College Park, MD — Tunneling spectra of the normal state of electron-doped cuprates at low temperatures and in magnetic fields higher than the upper critical field (H_{c2}) have shown evidence of a pseudogap. However, to understand if the origin of this pseudogap is the same as the pseudogap observed in hole-doped cuprates and to determine the theoretical model it supports, it is necessary to study the effect of high magnetic fields on this pseudogap. Point contact spectroscopy (PCS) was carried out on junctions between electron doped cuprate $Pr_{2-x}Ce_xCuO_4$ (PCCO, $0.13 < x < 0.17$) single crystals and normal metal (Pt-Rh). To probe the normal state at low temperatures ($T \sim 1.5$ K), the superconductivity was suppressed by applying high magnetic fields (up to 32 T). These experiments showed that the normal state gap is present for all the dopings, including the overdoped one. These results at high magnetic fields can be interpreted as a combined effect of precursor superconductivity and the presence of disorder in these materials.

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