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The effect of 3d paramagnetic impurities on superconductivity in quench-condensed amorphous Pb films ASHWANI KUMAR, DAN E. READ, JEFFREY S. PARKER, H JEFFREY GARDNER, PENG XIONG, Department of Physics and MARTECH, Florida State University — A modified dilution refrigerator equipped with Sb, Pb and NiCr sources is used to carry out an *in situ* study of the effect of magnetic impurities (MI) on the same quench-condensed Pb films. Si substrate with pre-deposited Au contacts is mounted in dilution unit and cool down to 5K. To ensure the electrical and possibly structural homogeneity down to monolayer thickness, we deposit a thin layer of Sb prior to the Pb evaporation. At a thickness above 8 ? the film exhibits superconductivity with well-defined resistive transition and T_c controlled by the film thickness. When a film of desired T_c is obtained we incrementally evaporate MI onto the film by heating a NiCr wire at constant current and perform *in situ* measurements. We observe that T_c is continuously suppressed with increasing MI density while the resistive transitions remain sharp, although the MI induces significant filling of states inside the gap. The T_c as a function of MI density is well described by the Abrikosov-Gorkov theory regardless of the starting T_c and the pair-breaking strength of the MI appears to be independent of the degree of disorder.

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