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Confinement induced anisotropy of superconducting films onto porous anodized aluminum oxide QIONG LUO, ZHILI XIAO, Northern Illinois University, Argonne National Lab, WAI-KWONG KWOK, Argonne National Lab — We investigate the matching effect observed in superconducting Nb films sputtered on anodized aluminum oxide substrates containing regular arrays at various external magnetic field orientations. We find that both the magnetoresistance and the transition temperature exhibits two strong anisotropic effects: Little-Parks oscillations whose period varies with field direction superimposed on a smooth background arising from one dimensional confinement by the finite lateral space between neighboring holes, revealing the anisotropy change due to the confinement effect of artificial holes.

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