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Parallel Upper Critical Field Slope in Niobium Thin Films: Comparison to Theory PHILLIP BROUSSARD, Covenant College, ANGELA HUNZIKER, University of Basel, AMY DAVIS, Covenant College — Thin films of niobium deposited by magnetron sputtering have been characterized by critical field measurements with the magnetic field applied parallel to the film plane. Films with thicknesses varying from 17 to 52 nm were grown using various deposition conditions so that the "dirtiness" parameter $\lambda_{\rm tr} = \xi/\ell_{\rm tr}$ (where $\xi = \hbar v_F/(2\pi k_B T_{c0})$ is an effective coherence length, T_{c0} is the zero field critical temperature, and $\ell_{\rm tr}$ is the elastic mean free path) varied from 2 to 11. The ratio of film thickness to ξ varied from 0.4 to 1.4. The expected linear dependence of B^2 vs T is observed, and the values of the slopes of these plots are compared to the predictions of Hara and Nagai (J. Phys. Soc. Japan, **63**, 2331 (1994)). We see a systematic lack of agreement between theory and experiment, with experimental values lower than the theoretical predictions, even after including possible strong coupling corrections.

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