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**Thin Film Fractal Morphology and the Enhancement of Superconducting Critical Parameters** J. KRIM, M. HIGHLAND, North Carolina State University — In superconducting films, it is known that the use of artificial defects can enhance a films' superconducting critical parameters. In particular, it has recently been reported that regular arrays of sub-micron sized holes produced by means of lithographic techniques can substantially increase the critical temperature for all fields. [1] We report here our observations that careful control of Pb film deposition conditions can result in film texture that has naturally occurring "holes" and enhanced critical parameters reminiscent of the artificially structured films. We characterize the texture of these films via their fractal dimension, and find that it is a useful approach for characterizing a films superconducting critical parameters. This work was funded by NSF and AFOSR.

[1] A.V. Silhanek et al., PRB **72**, 014507 (2005)

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