Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

**Investigating gecko setae adhesion using a dual-axis MEMS force sensor**[1] GINEL HILL, DANIEL SOTO, Stanford University, ANNE PEATTIE, ROBERT FULL, University of California, Berkeley, THOMAS KENNY, Stanford University — A dual-axis piezoresistive MEMS force sensor was used to investigate the role of orientation angle on the adhesion of gecko hairs, called setae. Made of keratin with nanoscale features, gecko setae are a spectacular, robust dry adhesive with anisotropic adhesion properties. A wealth of recent research has been devoted to synthetic mimicry of the gecko seta. However, most synthetics do not yet display anisotropic adhesion, which is critical for controllable attachment and release. Previous research using a wire gauge tested the role of the pitch angle between the stalk of natural setae and the substrate and found a dramatic cutoff angle of 30°, above which setae detach from the substrate [1]. The present work details the effect of the "roll" angle on natural setae adhesion. [1] K. Autumn, et al. Nature, 405: 681 (2000).

[1]Supported by a Stanford Graduate Fellowship and NSF Grants DMI-0304209 and ECS-9731293.

Ginel Hill
Stanford University

Date submitted: 05 Dec 2006 Electronic form version 1.4