Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

How cats lap ROMAN STOCKER, PEDRO REIS, MIT, SUNGHWAN JUNG, Virgina Tech, JEFFREY ARISTOFF, Princeton University — We studied the lapping of the domestic cat (*Felis catus*) by combining high-speed photography with a laboratory model of lapping. We found that *Felis catus* laps by a subtle mechanism based on water adhesion to the dorsal side of the tongue and the creation of a liquid column, exploiting inertia to defeat gravity and pull liquid into the mouth. The competition between inertia and gravity controls the pinch-off time of the column, determining the optimal lapping frequency, f. *Felis catus* was found to operate near the optimum and theoretical analysis yielded a scaling, $f \sim M^{-1/6}$, of lapping frequency with animal mass, M. This prediction was verified by measuring lapping frequency across felids, from ocelots to lions, suggesting that the lapping mechanism is conserved among felines.

Roman Stocker
MIT

Date submitted: 04 Aug 2010 Electronic form version 1.4