Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Ground resistance influences lizard burial in dry and wet sand
SARAH SHARPE, ROBYN KUCKUK, DANIEL GOLDMAN, Georgia Institute of Technology — Many terrestrial animals move within soil in which water content can vary, and little is known about how water content affects locomotor performance. To investigate the effect of water content on burial, we created controlled dry and wet substrates. We used 0.3 mm glass particles and varied water content W, the mass of water to mass of dry loosely packed sand. Drag force on a submerged 1.6 cm diameter rod increased by a factor of 4 as W increased from 0 to 0.03, after which force increases were small. Drag force in wet media periodically fluctuated with time and corresponded with surface fracturing. We characterized how W affected burial performance and strategy of a generalist burrower, the ocellated skink lizard (*Chalcides ocellatus*). High speed x-ray imaging was used to measure head, body and limb kinematics in substrates with W= 0 and W= 0.03. In both states during burial the body was maintained in a curved posture and the animal moved using a start-stop motion. During movement, the head oscillated and the forelimb on the convex side of the body was used to push the animal forward. Both speed and angular excursion of the head oscillation decreased in the W= 0.03 state. The differences in locomotion were attributed to the changing resistance force within the media.

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Date submitted: 03 Aug 2012 Electronic form version 1.4