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Legless locomotion in lattices PERRIN SCHIEBEL, DANIEL I. GOLDMAN, Georgia Institute of Technology — Little is known about interactions between an animal body and complex terrestrial terrain like sand and boulders during legless, undulatory travel (e.g. snake locomotion). We study the locomotor performance of Mojave shovel-nosed snakes (*Chionactis occipitalis*, $\approx$ 35 cm long) using a simplified model of heterogeneous terrain: symmetric lattices of obstacles. To quantify performance we measure mean forward speed and slip angle, β_s, defined as the angle between the instantaneous velocity and tangent vectors at each point on the body. We find that below a critical peg density the presence of granular media results in high speed ($\approx$ 60 cm/s), low average slip ($\overline{\beta_s} \approx 6^\circ$) snake performance as compared to movement in the same peg densities on hard ground ($\approx$ 25 cm/s and $\overline{\beta_s} \approx 15^\circ$). Above this peg density, performance on granular and hard substrates converges. Speed on granular media decreases with increasing peg density to that of the speed on hard ground, while speed on hard ground remains constant. Conversely, $\overline{\beta_s}$ on hard ground trends toward that on granular media as obstacle density increases.

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