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Turning and maneuverability during sidewinding locomotion HENRY ASTLEY, DANIEL GOLDMAN, DAVID HU, Georgia Institute of Technology — Sidewinding is an unusual form of snake locomotion used to move rapidly on yielding substrates such as desert sands. Posteriorly propagating waves alternate between static contact with the substrate and elevated motion, resulting in a "stepping" motion of body segments. Unlike lateral undulation, the direction of travel is not collinear with the axis of the body wave, and posterior body segments do not follow the path of anterior segments. Field observations indicate that sidewinding snakes are highly maneuverable, but the mechanisms by which these snakes change direction during this complex movement are unknown. Motion capture data from three Colorado Desert sidewinder rattlesnakes (*Crotalus cerastes laterorepens*) shows a variety of turn magnitudes and behaviors. Additionally, sidewinders are capable of "reversals" in which the snakes halts forward progress and begins locomotion in the opposite direction without rotation of the body. Because the head is re-oriented with respect to the body during these reversals, the snake is able to reverse direction without rotation yet continue moving in the new direction without impediment to perception or mechanics, a rare level of maneuverability in animals.

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