Catenaries in Drag BRATO CHAKRABARTI, JAMES HANNA, Engineering Science and Mechanics, Virginia Tech — Dynamical equilibria of towed cables and sedimenting filaments have been the targets of much numerical work; here, we provide *analytical* expressions for the configurations of a translating and axially moving string subjected to a uniform body force and local, linear, anisotropic drag forces. Generically, these configurations comprise a five-parameter family of planar shapes determined by the ratio of tangential (axial) and normal drag coefficients, the angle between the translational velocity and the body force, the relative magnitudes of translational and axial drag forces with respect to the body force, and a scaling parameter. This five-parameter family of shapes is, in fact, a degenerate six-parameter family of equilibria in which inertial forces rescale the tension in the string without affecting its shape. Each configuration is represented by a first order dynamical system for the tangential angle of the body. Limiting cases include the dynamic catenaries with or without drag, and purely sedimenting or towed strings.

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