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Novel mechanism of dissipation in synthetic rotary motors CORINA BARBU, VINCENT CRESPI, The Pennsylvania State University — We study novel mechanisms of dissipation in nanoscale and molecular-scale motors. In traditional treatments of such systems, the background degrees of freedom are integrated out into a thermal bath, and the rotator is coupled directly to this bath via phenomenological terms such as viscous damping or Langevin forces. We have investigated a situation in which one degree of freedom is pulled out from the thermal bath and into the explicit equations of motion, interposed between the bath and the motor. We describe a regime in which the deceleration of an unpowered rotor follows a universal *power law*, rather than a standard exponential decay.

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