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Turbulence decay towards the linearly-stable regime of Taylor Couette RODOLFO OSTILLA MONICO, Physics of Fluids, Mesa+ Institute, University of Twente, SIEGFRIED GROSSMANN, Department of Physics, University of Marbuurg, ROBERTO VERZICCO, Dipartamento de Ingegneria Meccanica, University of Rome "Tor Vergata", DETLEF LOHSE, Physics of Fluids, Mesa+ Institute, University of Twente — DNS of turbulence decay in Taylor-Couette flow in the linearly stable regime is presented. A fixed radius ratio $\eta = 0.714$ is used, and initial Reynolds numbers of up to $Re \sim 10^5$ are reached. Simulations are run in an axially-periodic domain, and thus completely lack the end-plates effects which are present in experiments and cause Ekman effects leading to a supercritical transition to turbulence. Here, we start with a fully turbulent state in the unstable regime and enter the linearly stable regime by suddenly starting a (stabilizing) outer cylinder rotation. This stabilization causes the system to behave as a damped oscillator and correspondingly the turbulence decays. The evolution of the torque and wind kinetic energy is analysed and the period and damping of the oscillations are quantified as a function of Reynolds number.

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