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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Outline of the proof -- Regularization and continuation -- High norm estimate on Q2 -- High norm estimate on Q3 -- High norm estimate on Q1/0 -- High norm estimate on Q1/[not equal] -- Coordinate system controls -- Enhanced dissipation estimates -- Sobolev estimates.
Sommario/riassunto	"We study small disturbances to the periodic, plane Couette flow in the 3D incompressible Navier-Stokes equations at high Reynolds number Re. We prove that for sufficiently regular initial data of size [epsilon] [less than or equal to] c0Re-1 for some universal c0 > 0, the solution is global, remains within O(c0) of the Couette flow in L2, and returns to the Couette flow as t [right arrow] [infinity]. For times t >/-Re1/3, the streamwise dependence is damped by a mixing-enhanced dissipation effect and the solution is rapidly attracted to the class of "2.5 dimensional" streamwise-independent solutions referred to as streaks. Our analysis contains perturbations that experience a transient growth of kinetic energy from O(Re-1) to O(c0) due to the algebraic linear

instability known as the lift-up effect. Furthermore, solutions can exhibit a direct cascade of energy to small scales. The behavior is very different from the 2D Couette flow, in which stability is independent of Re, enstrophy experiences a direct cascade, and inviscid damping is dominant (resulting in a kind of inverse energy cascade). In 3D, inviscid damping will play a role on one component of the velocity, but the primary stability mechanism is the mixing-enhanced dissipation. Central to the proof is a detailed analysis of the interplay between the stabilizing effects of the mixing and enhanced dissipation and the destabilizing effects of the lift-up effect, vortex stretching, and weakly nonlinear instabilities connected to the non-normal nature of the linearization"--