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Squire's transformation and 3D Optimal Perturbations in Bounded Parallel Shear Flows JEAN-MARC CHOMAZ, J. JOHN SOUNDAR JEROME, LadHyX, CNRS-Ecole Polytechnique — The aim of this short communication is to present the implication of Squire's transformation on the optimal transient growth of arbitrary 3D disturbances in parallel shear flow bounded in the cross-stream direction. To our best knowledge this simple property has never been discussed before. In particular it allows to express the long-time optimal growth for perturbations of arbitrary wavenumbers as the product of the gains from the 2D optimal at a lower Reynolds number itself due to the Orr-mechanism by a term that may be identified as due to the lift-up mechanism. This property predict scalings for the 3D optimal perturbation well verified by direct computation. It may be extended to take into account buoyancy effect.

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