

# 2D Incompressible Euler Equation Linearized at Shear Flows: An Introduction

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January 14th 2022

**Abstract** In this talk, we will start with an introduction on the linearized 2d incompressible Euler equation at shear flows in a fixed strip with slip condition. Shear flows are a fundamental class of stationary solutions in the form of  $v = (U(x_2), 0)^T$ . I will present an introduction to some classical results about linear instability near shear flows, such as Rayleigh necessary condition, Howard's semicircle theorem, and results about linear instability arising from inflection values of  $U$ . If time permits, we will also discuss the linear inviscid damping at Couette flows as well as the linear instability of gravity water waves where a water surface is involved.