

Abstract Submitted  
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**Anisotropic Eddy Viscosity in a Separated Turbulent Boundary Layer**<sup>1</sup> DANAH PARK, ALI MANI, Stanford University — We provide a direct measurement of the eddy viscosity in a separated turbulent boundary layer where a separation bubble is induced in a fully turbulent boundary layer over a flat plate. The study is conducted using a statistical technique called the macroscopic forcing method (MFM), with data gathered from direct numerical simulations. In this work, we employed MFM to reveal the leading-order eddy viscosity operator which can be expressed as a fourth-order tensor acting on the local mean velocity gradient. Our result indicates a highly anisotropic eddy viscosity. We contrast the computed eddy viscosity against the standard Spalart-Allmaras model to identify the key anisotropic directions influencing the momentum budget in the Reynolds-Averaged Navier-Stokes equation.

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