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Analysis of Structure Functions for the Turbulent Ekman Layer Direct Simulation SCOTT WAGGY, SEDAT BIRINGEN — A direct numerical simulation of the low-Reynolds number turbulent Ekman layer was performed to assess the validity of Kolmogorov similarity laws in rotating turbulent flows. The three dimensional mean flow exhibited by the Ekman layer offers complex energy transfers not encountered in simple two-dimensional turbulent flows with one main mean shear direction. Time averaged 2nd order velocity structure functions were calculated to determine the extent of the inertial subrange at low Reynolds numbers. In addition, the constant C_2, a universal constant of the structure functions, was compared with non-rotating boundary layers to analyze its applicability to different flows. The degree to which higher order structure functions abide by Kolmogorov's scaling was also analyzed for 3rd and 4th order structures.

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