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An Experimental Study of Flow Separation over 2D Transverse Grooves EMILY JONES, AMY LANG, FARHANA AFROZ, JENNIFER WHEELUS, DREW SMITH, The University of Alabama — A shark's scales help to reduce drag over its body by controlling boundary layer separation over its skin. It is theorized that the scales bristle when encountering a reversing flow, thereby trapping vortices between the scales, creating a partial slip condition over the surface and inducing turbulence augmentation in the boundary layer. In an attempt to replicate and study these effects, a spinning cylinder was used in a water tunnel to induce separation over a flat plate with 2 millimeter square 2D transverse grooves. The results were compared to separation occurring over a flat plate without grooves using DPIV. The angular speed of the cylinder was varied. The observed delays in separation, changes in separation bubble shedding frequency and other effects upon the boundary layer are discussed.

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