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Turbulence augmentation to achieve separation control over a bristled shark skin model[1] LEAH MENDELSON, Franklin W. Olin College of Engineering, AMY LANG, DREW SMITH, University of Alabama — The skin of fast-swimming sharks is covered with scale-like denticles capable of bristling to form cavities instead of lying flat against the body. These may be valuable for delaying flow separation and reducing net drag forces. This complex 3D roughness geometry alters the flow through the creation of vortices in the cavities and augments the behavior of the boundary layer. Understanding these flow phenomena is necessary for replicating the shark's passive flow control mechanisms. A model of bristled shortfin mako denticles in turbulent flow was tested in a water tunnel facility using Digital Particle Image Velocimetry (DPIV) to study the impact of the shark skin on the boundary layer. Results of these experiments, including influence on the time-averaged boundary layer profiles and Reynolds stresses over the span of the model, will be discussed.

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