

Abstract Submitted  
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**On the Hydrodynamic Function of Sharkskin: A Computational Investigation** AARON BOOMSMA, FOTIS SOTIROPOULOS, University of Minnesota — Denticles (placoid scales) are small structures that cover the epidermis of some sharks. The hydrodynamic function of denticles is unclear. Because they resemble riblets, they have been thought to passively reduce skin-friction—for which there is some experimental evidence. Others have experimentally shown that denticles increase skin-friction and have hypothesized that denticles act as vortex generators to delay separation. To help clarify their function, we use high-resolution large eddy and direct numerical simulations, with an immersed boundary method, to simulate flow patterns past and calculate the drag force on Mako Short Fin denticles. Simulations are carried out for the denticles placed in a canonical turbulent boundary layer as well as in the vicinity of a separation bubble. The computed results elucidate the three-dimensional structure of the flow around denticles and provide insights into the hydrodynamic function of sharkskin.

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