

Abstract Submitted
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Experimental study of turbulent structures over hairy poro-elastic surfaces MARIE COULIOU, Department of Mechanics, KTH, Stockholm, Sweden, JONAS HANSSON, WOUTER VAN DER WIJNGAART, Micro and Nanosystems, KTH, Stockholm, Sweden, FREDRIK LUNDELL, SHERVIN BAGHERI, Department of Mechanics, KTH, Stockholm, Sweden — Flows over slender, deformable and dense structures are ubiquitous in both nature and technological applications, ranging from the atmospheric flow over trees to the flow over the skin of organisms. In order to create a fundamental understanding of how poro-elastic surface can be used for flow control purposes, our work focuses on the behaviour of wall-bounded turbulent flows over fibrous poro-elastic surfaces. We fabricate the coatings using Off-Stoichiometry-Thiolene-Epoxy (OSTE+) polymers and multidirectional UV-lithography which enables us to design arrays of flexible pillars with various geometrical parameters (aspect ratio, pitch, inclination, etc.). We assess the effects of these coatings on an overlying low-Reynolds number turbulent flow using a water-table facility and PIV measurements. In particular, we focus on the modification of near wall turbulent structures in both space and time due to the presence of the poro-elastic coatings.

Marie Couliou
Department of Mechanics, KTH, Stockholm, Sweden

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