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Sailing effect on high performance bicycle wheels FLAVIO NOCA, hepia - University of Applied Sciences - Switzerland, JEAN-PIERRE MERCAT, BRIEUC CRETOUX, FRANCOIS-XAVIER HUAT, MAVIC - France — Recently, MAVIC and hepia (University of Applied Sciences in Switzerland) developed the most aerodynamic bicycle wheel on the market. The key feature of this wheel is its ability to sail in a cross-wind, just like a sailboat. The phenomenon relies on features on the tire itself. While it was thought in the past that wheel/tire smoothness was the key to good performance, our team discovered that adequately designed patterns on the tire allowed cross-winds to remain attached around the front wheel. The flowfield is very similar to that of an airfoil at incidence, and thrust forces (in the direction of travel) can even be generated. Experiments are being conducted in a wind tunnel and in a towing tank in order to examine the aerodynamic influence of patterned structures on the leading edge of airfoils and wheels at intermediate Reynolds numbers.

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