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Physics in water slides JEAN-BAPTISTE THOMAZO, ETIENNE REYSSAT, MARC FERMIGIER, PMMH, ESPCI — Water slides are body-size inclined pipes fed with water to improve sliding. Water is allowed to freely flow down the slide. It forms a lubrication film that reduces friction between the slide and the body, allowing sliders to travel down at high speeds. We present the results of an experimental study on a model water slide at the scale of the laboratory. We analyze the sliding velocities of cylindrical objects of various masses and sizes sliding down an inclined gutter fed with a controlled flux of water. In the range of parameters that we have studied, we show that the speed of the model sliders is faster than the flow of the enviroing water. We propose a minimal model to account for the observed sliding velocities measured in our experiments. The sliding velocity is set by a balance of the apparent weight with inertial drag or viscous friction in the lubrication film under the slider. Other resisting mechanisms will also be discussed.

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