

Abstract Submitted  
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**Surfboard Dynamics** ELINE DEHANDSCHOEWERCKER, Laboratoire d'Hydrodynamique de l'Ecole Polytechnique (LadHyX), DAVID QUERE, Laboratoire de Physique et Mecanique des Milieux Heterogenes (PMMH), CHRISTOPHE CLANET, Laboratoire d'Hydrodynamique de l'Ecole Polytechnique (LadHyX) — There are two main phases in surfing : catching and riding the wave. Field observations reveal that the board shape and mass distribution play a major role in both phases. To understand and optimize wave transport, we have developed an experimental setup that allows us to control the different physical parameters. A wave-maker generates either propagating periodic waves (whose wavelength and amplitude are accurately controlled) or breaking waves (whose height and velocity can be changed). Balsa boards (with different aspect ratios, mass distributions and submerged volumes) are used as floating bodies with variable friction on the water waves. We thus study the motion of boards towed onto waves. We first focus on the conditions needed for the board to be captured by the wave. We also determine the surfboard dynamics by using a force sensor responsive to the propulsive force of the wave on the surfboard. Finally, we show that the main parameters that affect this force are the slope of the wave and the shape of the board.

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