

Abstract Submitted
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How do hydraulic jumps form? ANDERS ANDERSEN, TOMAS BOHR, Department of Physics and Center for Fluid Dynamics, Technical University of Denmark — We present an experimental and theoretical study of the formation of stationary hydraulic jumps in a narrow channel. We start each measurement with an empty channel and change the flow-rate abruptly from zero to a constant positive value. This leads to the formation of a stationary hydraulic jump in a two stage process: first the channel fills by the advancing fluid front, which undergoes a transition from supercritical to subcritical at some position in the channel, and later the influence of the downstream boundary conditions makes the jump move upstream to its final position with exponentially decreasing speed. We compare our experimental findings with theoretical predictions based on Rayleigh type shock theory.

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