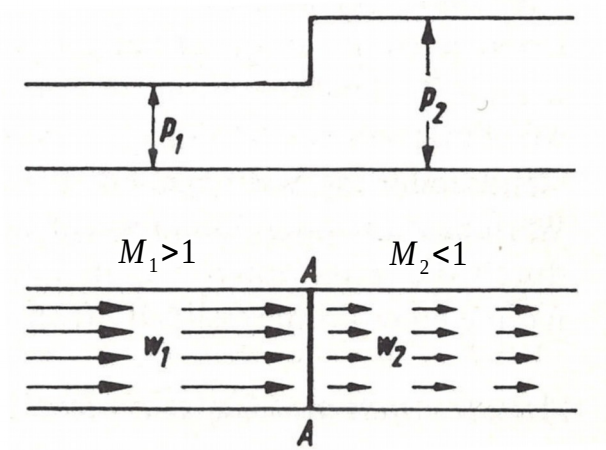
# Are hydraulic jumps and compression shocks analog?

## One-dimensional flow approximation

### Gas

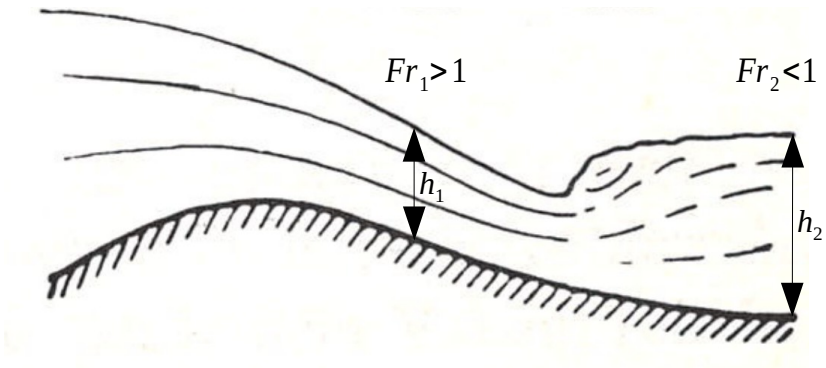
Mach number $M = \frac{u}{c}$




L. Prandtl et al. (1993), *Führer durch die Strömungslehre*, p. 112

### Water

Froude number $Fr = \frac{u}{\sqrt{gh}}$




L. Prandtl et al. (1993), *Führer durch die Strömungslehre*, p. 89



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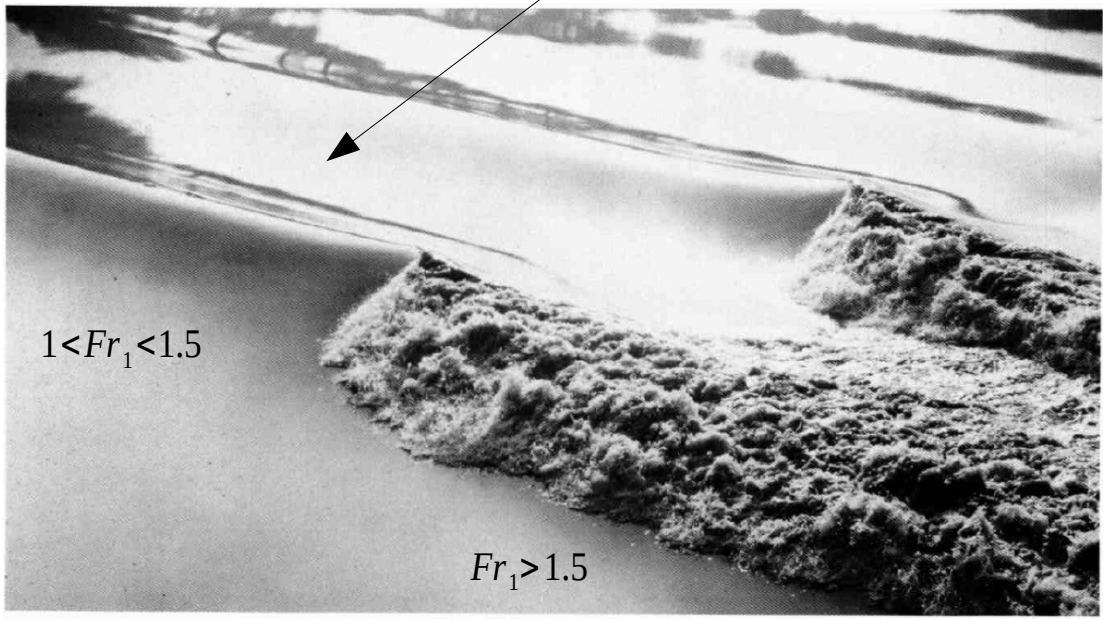
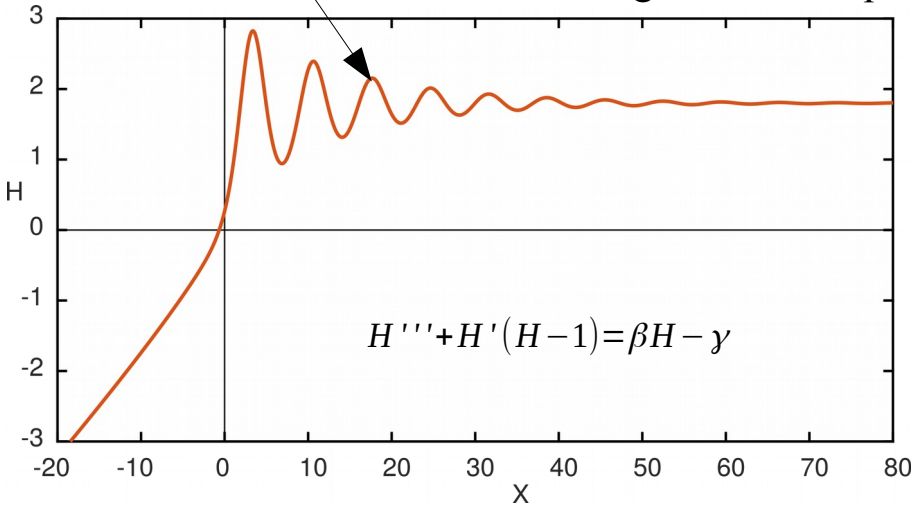
Undular hydraulic jump




M. van Dyke (1982), *An album of fluid motion*, p. 116, Photograph by D.H. Peregrine

Solution of the extended Korteweg–de Vries Eq.




Analogy to "collisionless shocks":
see R.E. Meyer (1967), *J. Math. Phys.* 8:1676–84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