Buckling of Soda and Beer Cans

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The Problem: Nonlinear Buckling of the ‘Real’ Can

- The buckling thresholds of imperfect structures are dramatically underestimated by the linear stability analysis.
- One needs to study the linear buckling of defected shells.
The Scale of the Problem

⇒ Buckling is a “primary design driver in NASA launch vehicle designs”

But why there is still a need for 1:1 scale tests?

By The numbers:
- started in 2007
- 8.4 m diameter
- load 400 KN,
The Approach: Turbulence in Pipe Flow

Reynolds 1883

Darbyshire-Mullin 1994

Turbulence can be triggered by finite amplitude perturbation (A nonlinear instability of a perfect pipe)
Nonlinear Buckling of the ‘Perfect’ Can