Periodic solutions for some hyperbolic PDEs
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We consider periodic solutions for a nonlinear wave equation and a beam equation on the unit interval. These are infinite dimensional Hamiltonian systems. Numerically, solutions for rational frequencies appear to lie on "branches", and these branches appear to undergo bifurcations. But things cannot be that simple, since there are small denominator problems for irrational frequencies. We describe some numerical observations and some rigorous results. The latter include the existence of non-small periodic solutions for the beam equation for positive-measure sets of frequencies.

This is joint work with Gianni Arioli, Politecnico di Milano, Italy