Hydrodynamic models and boundary confinement effects

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Fluid dynamics (and continua in general) can be given an axiomatic structure that makes for a consistent mathematical theory. The extent to which some of the underlying mathematical assumptions reflect realistic physical properties of fluid behavior, and the inherent limitations of their unavoidable idealizations, is perhaps best illustrated by the evolution of fluids interacting with boundaries. This talk will review elements of the theory and discuss some of the features encountered in modeling fluids under these circumstances.