Models for boundary layer separation: beyond the Prandtl equation?

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Abstract

The Prandtl equation was derived in 1904 by Ludwig Prandtl in order to describe the behavior of fluids with small viscosity around a solid obstacle. Over the past decades, several results of ill-posedness in Sobolev spaces have been proved for this equation. As a consequence, it is natural to look for more sophisticated boundary layer models, that describe the coupling with the outer Euler flow at a higher order. Unfortunately, these models do not always display better mathematical properties, as I will explain in this talk. This is a joint work with Helge Dietert, David Gérard-Varet and Frédéric Marbach.

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