Non-uniqueness of Leray solutions to the forced
Navier-Stokes equations

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Abstract. In a seminal work, Leray demonstrated the existence of
global-in-time weak solutions to the Navier-Stokes equations in three
dimensions. Are Leray’s solutions unique? This is a fundamental ques-
tion in mathematical hydrodynamics, which we answer in the negative
within the ‘forced’ category, by exhibiting a one-parameter family of
distinct Leray solutions with zero initial velocity and identical body
force. This is joint work with Elia Brué and Maria Colombo.