

Abstract Submitted  
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**A Fluid Mechanic's Analysis of the Tea-Cup Singularity<sup>1</sup>**

DWIGHT BARKLEY, University of Warwick — In 1926 Einstein published a short paper explaining the meandering of rivers. He famously began the paper by discussing the secondary flow generated in a stirred tea cup – the flow now widely known to be responsible for the collection of tea leaves at the center of a stirred cup of tea. In 2014, Luo and Hou presented detailed numerical evidence of a finite-time singularity in a rotating, incompressible, inviscid flow. The key driving mechanism of that singularity is the secondary tea-cup flow. The present work is not aimed at proving the existence of a singularity in this flow, nor is it aimed at generating more highly resolved numerical evidence for the singularity than already exists. Rather, I will assume that the flow simulated by Luo and Hou genuinely develops a singularity. My goal is to understand, from a fluid-mechanics perspective, why.

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