

Abstract Submitted
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The role of substrate geometry on droplet evaporation¹ JOHN MCCARTHY, Department of Engineering Science, University of Oxford , DOMINIC VELLA, Mathematical Institute, University of Oxford, ALFONSO A. CASTREJON-PITA, Department of Engineering Science, University of Oxford — The coffee ring effect is the name given to the phenomenon where particles suspended in an evaporating droplet migrate towards the contact line, producing characteristic dense rings of particles. It is observed in many everyday and technological settings, from stains after coffee spills to imperfections in inkjet printed objects. Methods to control and even suppress this - often undesired - effect include the use of tailored mixtures of solvents to control evaporation, the use of elongated particles, the use of electrowetting and surface acoustic waves to induce internal flows, etc. All these methods have the objective of reducing, eliminating or overcoming the capillary flows leading to the deposition of suspended particles along the contact line during (differential) evaporation. Each method limits to some extent the type of droplets for which it can be used. We explore the role played by substrate geometry in controlling the evaporation of droplets and its role on the formation, or otherwise, of a coffee ring.

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John McCarthy
Department of Engineering Science, University of Oxford

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