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Thermo-responsive droplet deposition and solidification MAZIYAR JALAAL, Department of Mechanical Engineering, University of British Columbia, CAROLA SEYFERT, Institute of Fluid Mechanics, Technical University of Dresden, BORIS STOEBER, Department of Mechanical Engineering, University of British Columbia, NEIL BALMFORTH, Department of Mathematics, University of British Columbia — The spreading of a thermo-responsive droplet on a heated surface is studied. The spatio-temporal pattern of gel formation within the droplet is visualized using a new experimental method based on spectral domain optical coherence tomography. The method relies on a collective motion of sub-micron buoyant particles inside the droplet. The mechanisms that lead to the arrest of the spreading droplet are explored. The importance of evaporation-induced gel formation and heat conduction through surrounding air are highlighted. The proposed experimental technique can potentially be used to analyze the solidification of different fluids such as molten waxes. Thermo-responsivity is demonstrated to provide an effective control over the final shape of the droplet.

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