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Dewetting of a Liquid-Liquid System STEFAN BOMMER, NIKOLAS BECKER, Experimental Physics, Saarland University, 66041 Saarbruecken, Germany, SEBASTIAN JACHALSKI, DIRK PESCHKA, Weierstrass Institute for Applied Analysis and Stochastics, 10117 Berlin, Germany, BARBARA WAGNER, Institute for Mathematics, Technical University Berlin, 10623 Berlin, Germany, RALF SEEMANN, Experimental Physics, Saarland University, 66041 Saarbruecken, Germany — In recent years a thorough understanding of thin film dewetting from solid substrates was developed. However, the understanding of a thin liquid film dewetting from another liquid remained scarce. By *in situ* AFM studies we explore the dewetting dynamics and the morphologies of liquid polystyrene (PS) dewetting from liquid polymethyl-methacrylate (PMMA). Using a selective solvent allows to remove the dewetted PS layer and to image the liquid/liquid interface at selected times. Combining the PS/air and the PS/PMMA interfaces we obtain the full three dimensional shape of the dewetting morphologies. The characteristic shapes of the rim profiles, the equilibrating droplets and their dewetting dynamics depend not only on the ratios of viscosity and surface tension of the two liquids but also on the relative film height of the underlying liquid. The latter originates from the flow field of the dewetting liquid which penetrates surprisingly deep into the lower liquid it is dewetting from

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