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**Dewetting of microliquid film via vapor-mediated Marangoni effect** SEUNGHO KIM, HO-YOUNG KIM, Seoul National University — It is generally conceived that water film residing on a hydrophilic layer is much more stable than one on a hydrophobic layer. Here we show that the film on a hydrophilic layer can be punctured just by placing an alcohol drop near the film. It is because the concentration gradients of alcohol vapor deposited on water give rise to the Marangoni effect, which pulls the water film away from the alcohol drop. We term this behavior the vapor-mediated Marangoni dewetting. Two different film flow types are observed depending on the thickness of film. For a thin water film, a bulk film recedes from the center where the alcohol vapor concentration is the highest but leaves a thin fringe film. The nanoscale fringe film is then dried, leading to continuous growth of the hole. For a thick water film, no nanoscale fringe films are observed, but the hole growth is limited to a certain radius. The maximum hole radius in the thick film regime is determined by the balance between the hydrostatic pressure and the Marangoni stress. We visualize such novel film dewetting dynamics with a high-speed camera and characterize their salient features by combining experimental and scaling analysis.

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