Bubble entrapment during droplet impact on heated hydrophobic surfaces

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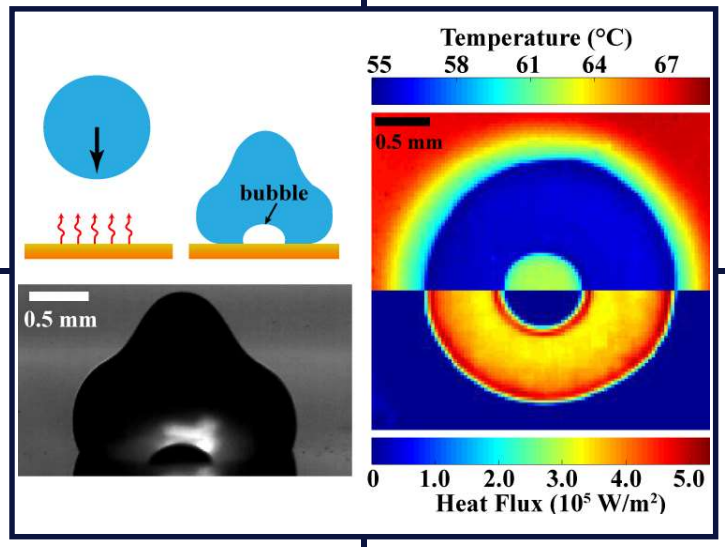

Motivation

Quantify influence of bubble entrapment on heat transfer performance for droplet impact on a heated substrate

Approach

- *Synchronized high-speed optical and infrared (IR) imaging*
- *Analysis of droplet dynamics and solid-liquid interfacial temperature and heat flux*

Key findings

- *An increase in surface temperature narrows the Weber number range of bubble occurrence*
- *The inner contact line can a have higher heat flux than the primary outer contact line*
- *The entrapped bubble reduces the total transferred heat by 5.9% and 6.7% at 50 ˚C and 65 ˚C surfaces, respectively*