Sound increases the efficiency of boiling

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Scientists at the Georgia Institute of Technology achieved a 17-percent increase in boiling efficiency by using an acoustic field to enhance heat transfer. The acoustic field does this by efficiently removing vapor bubbles from the heated surface and suppressing the formation of an insulating vapor film.

As reported in the American Institute of Physics' (AIP) journal the *Physics of Fluids*, bubble removal was enhanced because the acoustic field induces capillary waves on the bubble, causing its contact line to contract and detach the bubble from the surface.

The mechanisms associated with these interactions were explored using three acoustic experiments: an air bubble on the underside of a horizontal surface, a single vapor bubble on the top side of a horizontal heated surface, and pool boiling from a horizontal heated surface.

The researchers were able to isolate and identify the dominant forces involved in these acoustically forced motions by measuring the capillary waves induced on the bubbles, bubble motion, and heat transfer during boiling.

More information: Acoustically Enhanced Boiling Heat Transfer, by Zachary Douglas et al. *Physics of Fluids*, 2012.

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