Abstract Submitted
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On the effect of wicking on droplet cooling[1] MANUEL AULIANO, DAMIANO AULIANO, MARIA FERNANDINO, NTNU, PIETRO ASINARI, Politecnico di Torino, CARLOS DORAO, NTNU — Enhancing the droplet cooling is important for an efficient and safe design of thermal management applications, such as electronics, nuclear and aeronautics industry. For enhancing the droplet cooling heat transfer, it is desirable that the droplet spreads as much and as fast as possible. In this regard, tailoring the surface with micro/nanostructures is a promising approach that controls the surface wettability and the heat transfer performance. This work focuses on the effect of the wicking of super-hydrophilic stochastic Si nanowires on droplet evaporation from low to high temperatures. The research method consisted in fabricating Si nanowires with different heights and characterizing the wickability of the surfaces prior to the heat transfer experiments. The evaporation performance of the processed samples has been discussed in terms of the droplet evaporation time. A significant reduction of the evaporation time and shift of the Leidenfrost point were observed and attributed to the strong wicking provided by the nanostructured surfaces.

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