

Two-Phase Cooling of Targets and Electronics for Particle Physics Experiments

Thursday, 24 September 2009 15:00 (45 minutes)

An overview of the author's decade of experience with two-phase cooling research for computer chips and power electronics will be described with its possible beneficial application to high energy physics experiments. Flow boiling in multi-microchannel cooling elements in silicon (or aluminium) have the potential to provide high cooling rates (up to as high as 350 W/cm²), stable and uniform temperatures of targets and electronics, and light-weight construction while also minimizing the fluid inventory. An overview of two-phase flow and boiling research in single microchannels and multi-microchannel test elements will be presented together with videos of these flows. The objective is to stimulate discussion on the use of two-phase cooling in these demanding applications, including the use of CO₂.

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