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An Introduction to mm Scale Low Kinematic Viscosity Horizontal Channel Flow Morphology in Condensation and Pool Condensation in the Presence of Vapor Flow[1] MICHAEL KIVISALU, AMITABH NARAIN[2], JORGE KURITA, Michigan Technological University — Preliminary experimental flow regime types have been observed for partial and full condensation in a horizontal channel of millimeter scale. Effects of hydrostatic pooling, wall vibrations, vapor flow pulsations, and solid-liquid-vapor contact on the top surface of the condenser are observed. Wave phenomena such as wave reflection, standing waves, and waves on the interface of vapor bubbles are presented in 2 and 3 dimensions. Due to the high density and low kinematic viscosity of the liquid phase of the fluid (perfluorohexane), the effects observed are primarily inertial. It is found that in these flows pressure pulsation and surface tension effects very strongly influence the morphology of the interface where it contacts the top wall. Wall vibrations contribute to standing waves on the interface. This investigation outlines some of the types of flow one might expect to encounter in a millimeter scale horizontal condenser with wall vibration and pressure pulsation where inertial effects dominate the liquid flow.

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