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Droplet Impact on a Heated Surface under a Depressurized Environment RYUTA HATAKENAKA, Japan Aerospace Exploration Agency, YOSHIYUKI TAGAWA, Tokyo University of Agriculture and Technology — Behavior of a water droplet of the diameter 1-3mm impacting on a heated surface under depressurized environment (100kPa -1kPa) has been studied. A syringe pump for droplet generation and a heated plate are set into a transparent acrylic vacuum chamber. The internal pressure of the chamber is automatically controlled at a target pressure with a rotary pump, a pressure transducer, and an electrical valve. A silicon wafer of the thickness 0.28 mm is mounted on the heater plate, whose temperature is directly measured by attaching a thermocouple on the backside. The droplet behavior is captured using a high-speed camera in a direction perpendicular to droplet velocity. Some unique behaviors of droplet are observed by decreasing the environmental pressure, which are considered to be due to two basic elements: Enhancement of evaporation due to the lowered saturation temperature, and shortage of pneumatic spring effect between the droplet and heated wall due to the lowered pressure of the air.

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