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Sub-cooled flow boiling in impacting drops on hot surfaces[1] MINORI SHIROTA, MASAKI KATO, Hirosaki University, HIROSAKI UNIVERSITY SHIROTA LAB TEAM — We experimentally observed several different types of sub-cooled boiling in impacting drops on heated solid surfaces. With the increase in the surface temperature, the boiling regime in an impacting water drop changes as follows: moderate nucleate boiling, micro-bubble emission boiling, circular-bubble-wave travelling boiling, oscillatory boiling, and Leidenfrost boiling. For the variation of the boiling regime, we proved that dynamic hypothesis is unlikely as the phenomena drastically changes only by altering the initial drop temperature. We have constructed a spherical bubble model describing the violent sub-cooled boiling in an impacting drop by taking into account the evaporation of micro-liquid layer beneath an expanding vapor bubble and the temperature distribution in an impacting drop.

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