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Scaling law on formation and rupture of a dynamical liquid bridge[1] HUANG ZHANG, ZEHAO ZHANG, Department of Thermal Engineering, Tsinghua University, QIANFENG LIU, Institute of Nuclear Energy and Technology, Tsinghua University, SHUIQING LI, Department of Thermal Engineering, Tsinghua University, DEPARTMENT OF THERMAL ENGINEERING, TSINGHUA UNIVERSITY COLLABORATION, INSTITUTE OF NUCLEAR ENERGY AND TECHNOLOGY, TSINGHUA UNIVERSITY COLLABORATION — The formation and breakup of a pendular liquid bridge in dynamic state is investigated experimentally. The experimental setup arises from a system to measure the coefficient of restitution (COR) of a glass sphere impacting and bouncing on a wetted surface. We compare the effect of surface tension and gravity on the liquid bridge rupture by the capillary length κ^{-1}. For water and liquid 1 (50% water mixed with 50% glycerol), the gravity is dominant on the liquid bridge breakup. And we find that the rupture distance is in good linear trend with the non-dimensional number G by the scaling law analysis. Further, for liquid 2 (25% water mixed with 75% glycerol) that is relatively high viscous, the linear changing of the rupture distance with the capillary number Ca is found. The relation of the rupture distance with G and Ca would be helpful in understanding the complex behavior of the dynamical liquid bridge.

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