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Playing with inclined circular hydraulic jumps LUC LEBON, BERYL SAGET, MARC DURAND, LAURENT LIMAT, YVES COUDER, MATHIEU RECEVEUR, Laboratoire Matière et Systèmes Complexes, UMR 7057 of CNRS and Paris Diderot University — We have investigated the structure of the circular hydraulic jump, when the jet impacts an inclined plate. At low plate slope, quasi-circular shapes, evolving towards elliptic shapes are observed. At moderate inclinations, the upper and lower jumps become markedly different, and the lower jump is even rejected to infinity when a critical inclination is reached. Above this critical inclination, the jump is coupled to an outer dewetting contact line to give a specific object (expanding impact sheet feeding a curved rim in which the liquid is flowing tangentially). In this regime, both the position and curvature of the upper jump follows unusual scalings with the flow rate that completely differ from those observed on horizontal plates. Finally we have looked to metastable drops trapped in the circular jump at very small inclinations. As reported in a previous APS, the lowest position in the jump can become unstable and the drops oscillate around the jump perimeter. We show that this behavior requires very specific conditions of surface tension and viscosity and propose simple interpretations for the instability mechanism.

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