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Rivulet between two planes: effect of inlet angle[1] PETER VOROBIEFF, NIMA FATHI, The University of New Mexico — The behavior of gravity-driven rivulets flowing down between two vertical planes has attracted considerable recent attention, driven both by practical interest and by the attractiveness of the problem from the point of view of nonlinear physics. In this investigation, we study the effects of Reynolds number and variations of the inlet boundary conditions on the rivulet flow. The latter include variation in the entrance angle of the inlet with respect to vertical in the plane containing the rivulet. The experimental arrangement allows to create or eliminate fluctuations in the discharge that drives the rivulet, which leads to changes in the flow patterns we observe, including transitions between different flow regimes, and in some cases coexistence of straight and meandering flow. For a wide range of flow regimes, elimination of fluctuations in the discharge rate leads to emergence of stable, straight, non-meandering flow. While a similar observation had been previously made for flows down an inclined plane, this result is interesting, because of differences in the boundary conditions.

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