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The shape and behaviour of a horizontal buoyant jet adjacent to a surface[1] HENRY BURRIDGE, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, GARY HUNT, Department of Engineering, University of Cambridge — We investigate the incompressible turbulent buoyant jet formed when fluid is steadily ejected horizontally from a circular source into a quiescent environment of uniform density. As our primary focus, we introduce a horizontal boundary. For sufficiently large source-boundary separations, the buoyant jet is 'free' to rise under the action of the buoyancy force. For smaller source-boundary separations, the jet attaches and 'clings' to the boundary before, further downstream, pulling away from the boundary. Based on measurements of saline jets in freshwater we deduce the conditions required for a jet to cling. We present data for the variation in volume flux, flow envelope and centreline for both 'clinging' and 'free' jets. For source Froude numbers $\mathrm{fr}_0 \geq 12$ the data collapses when scaled, identifying universal behaviours for both clinging jets and for free jets.

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