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Controlling thermal convection with sidewall heating. JUN ZHANG, MAC JINZI HUANG, New York University — Thermal convection of fluids takes place ubiquitously in nature and in our lives. It powers the motion of the earth's mantle, drives winds in the atmosphere and currents in the oceans, and determines how fast we cook food and cool computers. Once a temperature difference is applied across a fluid, a thermal energy passes through the fluid from the heated bottom to the cooled top. This heat flow is known to depend on the applied temperature difference. Here we study a simple way to control or modify this heat flow by injecting an additional heat flow from the side of the fluid. Our thermal system is reminiscent of an electronic transistor where an electrical current controls another electrical current.

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