

## **Thermoconvective effect in a slow viscous flow in a horizontal channel**

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### **Abstract**

A simple hydrodynamic model, which is specified by several equations, is used to illustrate the thermoconvective effect of the formation of vortex structures in a stably stratified fluid. The thermoconvective effect must take place in more complicated models without constraint on the minuteness of the Reynolds number, the constancy of the thermophysical properties of the fluid, and the channel geometry. The isothermal laminar viscous flow in a long horizontal channel is retained by a constant pressure drop, whereas the flowfield is represented by a parabolic profile of the longitudinal velocity component. Fundamental change in the flow pattern is led by nonuniform heating or cooling of the walls. The vortex cells are formed at the central part of the channel, whereas the shear stresses at the walls increases leading to an additional pressure loss in comparison to an isothermal flow.

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