Non-uniqueness of the thermohaline circulation in a three-layer ventilated ocean

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The thermohaline circulation in a three-layer ventilated ocean is shown to have 81 steady states, 16 of them stable and the others unstable. One unstable steady state in a phase space corresponds to a repeller, the other states correspond to saddle points. There are neither cycles nor other closed phase trajectories. The possibility of oscillations is excluded both by the analytical investigation of the spectrum and by the numerical results.

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