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Pattern formation in anticonvective systems DOMNIC MERKT, Erich-Weinert-Strasse 1, 03044 Cottbus, Germany, UNIVERSITY OF COTTBUS, THEORETICAL PHYSICS II TEAM — Two-layer fluid systems with an undeformable interface heated from above in the presence of gravitational forces may show a rather paradox transition from conductive to convective states. This instability was found by WELANDER[1] in 1964 and named anticonvection. Besides the applied temperature gradient various interactions at the interface play an essential role for anticonvection. I.e. this instability depends very sensitive on material parameters. Here we use the Boussinesq-approximation for incompressible fluids and classical boundary conditions of an undeformable interface. Starting from the basic hydrodynamic equations we derive the equations for the perturbed fields of the stationary state. A linear stability analysis for vertically infinitely extended systems can be done analytically. However, vertically bounded systems (in particular for experimental realization) require numerical investigations. We discuss the instability regime, influence of material parameters and show how vertical bounding effects this instability. Finally, numerical simulations of the fully nonlinear system show the resulting patterns for an anticonvective system and reveal velocity and temperature distributions in both fluids. [1] P.Welander, Tellus **16**, 349 (1964)

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