Bifurcation of symmetric domain walls for the Bénard-Rayleigh convection problem

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We prove the existence of domain walls for the Bénard–Rayleigh convection problem. Our approach relies upon a spatial dynamics formulation of the hydrodynamic problem, a center manifold reduction, and a normal forms analysis of an eight-dimensional reduced system. Domain walls are constructed as heteroclinic solutions connecting suitably chosen periodic solutions of this reduced system.