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A simple approach to localized convection H. PLEINER, Max Planck Inst. for Polymer Research, Germany, M.G. CLERC, Univ. de Chile, Santiago de Chile, J. MARTINEZ-MARDONES, Pont. Univ. Catolica de Valparaiso, Chile, L.M. PEREZ, Dep. Ingeneria Metalurgica, Univ. de Santiago, Chile, D. LAROZE, Max Planck Institute for Polymer Research, Mainz and Inst. de Alta Investigacion, Univ. de Tarapaca, Arica, Chile — Localized structures can be found in many different (dissipative) driven systems [1], an example being stationary and traveling convection structures in the thermal instability of binary fluids. Here, the special localized structure is a convective state between two quiescent, conductive ones, and can been interpreted as a pinning phenomenon close to a stationary sub-critical bifurcation. Generally, localized structures are described by using higher dimensional, complex amplitude or phenomenological prototype (e.g. Swift-Hohenberg) equations or by direct numerical integration of the hydrodynamic equations. Here we show, using the binary mixture convection in porous media as an example, that the analytically derived one-dimensional amplitude equation amended by non-adiabatic (non-resonant) terms important close to convection fronts, well describes localized convection states, in particular the slanted homoclinic bifurcation diagrams.

[1] O. Descalzi, M. Clerc, S. Residori, and G. Assanto (Eds.), Localized States in Physics: Solitons and Patterns, Springer, 2011.

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