Convection problems in presence of vertical throughflows for binary mixtures in porous layers

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Convection in porous media in the presence of vertical throughflow has a very large application such as in cloud physics, in subterranean pollution, in hydrological study and in many industrial processes where the throughflows can be important to control the onset and behavior of convection. In a porous layer, the effects of both temperature gradient and salt concentration on the stability of vertical flow are studied [1]. The definitely boundedness of the solutions (existence of absorbing sets) and global nonlinear stability of the throughflow solution, according to the methodology proposed by Rionero [2, 3], through the introduction of the auxiliary systems governing the Fourier components of the perturbations, are obtained.