Time-periodic traveling solutions of localized convection cells and their collision in binary fluid mixture[1] TAKESHI WATANABE, Research Institute for Electronic Science, Hokkaido University, KAZUTAKA TOYABE, Hokkaido University Graduate School of Science, MAKOTO IIMA, YASUMASA NISHIURA, Research Institute for Electronic Science, Hokkaido University — We study the mathematical structure of localized convection cell solutions in a binary fluid mixture, some of which are not observed in Rayleigh-Benard convection in a pure fluid. In particular, a solution representing time-periodic traveling localized convection cells (periodic traveling pulse, PTP) has not been obtained even numerically because this solution requires two unknown variables to be determined: group velocity and temporal period in the comoving frame with the group velocity. We developed a new integrated numerical method to obtain the PTP solution as well as the steady, periodic, and traveling solutions. By using this method, a global bifurcation structure containing a variety of solutions including PTPs is obtained and the phase dependence of the collision of counter- propagating PTPs is investigated in detail.

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