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Collisions of localized convection structures in binary fluid mixtures MANFRED LUECKE, Retired, ALEXANDER TARAUT, BORIS SMORODIN, Perm State University — Collisions of a localized traveling wave structure with a localized stationary structure are investigated. In ethanol-water mixtures with appropriately chosen negative separation ratios both exist bistably in the unstable quiescent surrounding for a range of supercritical heating rates. Depending on the Rayleigh number we observe different evolution scenarios of the onvection structures that appear as a result of the collision. The incident localized traveling wave can be absorbed by the stationary structure and then the latter expands: either both of its fronts get unpinned and propagate into the quiescent fluid or only the one that is hit propagates while the opposing one remains pinned. For smaller Rayleigh numbers the stationary structure is destroyed while the incident localized traveling wave survives and a second one is created that moves ahead of the incoming one, both being coupled together. The mechanisms involved in these scenarios are analyzed and elucidated with the help of finite difference numerical simulations that are carried out subject to realistic boundary conditions.

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