

Do elevators synchronize if not everyone boards an elevator that arrives early?

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Elevators are a familiar transporting system exhibiting nontrivial out-of-equilibrium behaviors. In this study, the dynamic behaviors of elevators are investigated, mainly focusing on the interaction between elevators. I introduced a new control parameter that changes the proportion of passengers who can get in an earlier-arriving elevator and investigated the behaviors of elevators when the proportions of those passengers and the inflow of passengers were varied. When we increased the inflow of passengers, the synchronization was promoted and the round-trip time increased. On the other hand, when we increased the proportion of those passengers, the synchronization was promoted while the round-trip time decreased. To elucidate the relationship between the parameters and dynamics and clarify the mechanism, we established simple mathematical models.

