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An integrated rescheduling model for minimizing train delays in the case of line blockage

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Abstract Disturbances in rail networks propagate delays and reduce the reliability and stability of the train schedules. Thus, it is essential to manage the disturbances in rail networks. Railway disruption management includes effective ways to manage the operations in the case of unanticipated deviations from the original schedule. In this study, the temporary blockage of tracks on the rail network is regarded as a disruption. First, the basic scheduling model with the objective of minimizing the total travel time of trains will be provided. Consequently, the re-scheduling model, which is an extension of the basic model, is presented. The original schedule provided by the basic scheduling model will be used as an input for the re-scheduling model. The integrated model employs different recovery actions to better minimize the negative impact of disturbances on the initial schedule. The new plan includes a set of revised departure times, dwell times, and train running times. A heuristic approach was proposed to design the new plan within a reasonable time. To validate the model, the train re-scheduling model is tested for multiple disruption scenarios

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