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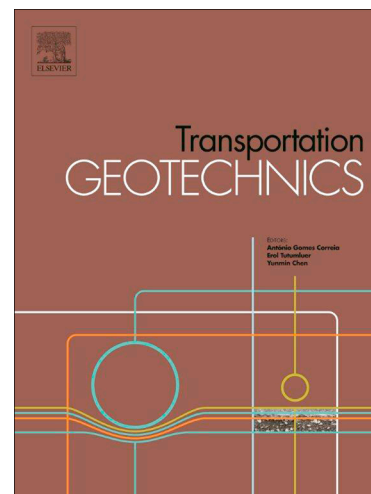
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Monitoring and repair of isolated trackbed defects on a ballasted railway

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Abstract

Ballasted railway track suffers from a gradual loss of vertical geometry (level) as a result of settlements caused by trafficking and differences in support conditions. However, certain trackbed defects giving rise to a particularly rapid and severe loss of geometry are often localised, and possibly associated with zones of inadequate or variable support stiffness. Conventional line-tamping (usually by machine) may not be effective for these isolated trackbed defects. This paper demonstrates, with reference to three particular defect sites on a ballasted railway in the UK, the benefits in terms of both effectiveness and longevity of a more targeted repair strategy at such locations. First, track-based instrumentation was used to assess the nature and extent of the defect and to identify differential support stiffness conditions, which might also need to be addressed. The data were then used to inform repair strategy; for example, deflections measured during train passage were used to specify the thickness of shims placed between the rail pad and the sleeper. Finally, the track-based instrumentation was used to monitor the effectiveness and longevity of the repair, providing evidence that adequate support conditions had been restored. At the three defect sites investigated, the localised repairs are shown to be more effective and longer-lived than conventional line-tamping.

Railway track, Trackbed defect repair, Tamping, Lineside monitoring, Track stiffness, Track vibration

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