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Extracting Rail Track Geometry from Static Terrestrial Laser Scans for Monitoring Purposes

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Abstract. This paper presents the capabilities of detecting relevant geometry of railway track for monitoring purposes from static terrestrial laser scanning (TLS) systems at platform level. The quality of the scans from a phased based scanner (Scanner A) and a hybrid time-of-flight scanner (Scanner B) are compared by fitting different sections of the track profile to its matching standardised rail model. The various sections of track investigated are able to fit to the model with an RMS of less than 3 mm. Both scanners show that once obvious noise and artefacts have been removed from the data, the most confident fit of the point cloud to the model is the section closest to the scanner position. The results of the fit highlight the potential to use this method as a bespoke track monitoring tool during major redevelopment projects where traditional methods, such as robotic total stations, results in missed information, for example due to passing trains or knocked prisms and must account for offset target locations to compute track parameters.

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