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 Optimal location of acoustic emission sensors for detecting rail damage

## Optimal location of acoustic emission sensors for detecting rail damage

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### Abstract

To detect cracks in rail sections, various experiments using the acoustic emission technique have been carried out by earlier researchers. However, the literature suggests that studies investigating the optimum location of acoustic emission sensors for the detection of cracks in railway tracks are rare. It is difficult to detect defects without the optimal placement of the sensor, owing to the complex geometry of the rail section as well as the high cost of sensors. Hence an attempt was made to find the optimum placement of a single sensor on a rail section to detect cracks precisely. A pencil lead break, which simulates a crack, was applied in the rail section to initiate such a crack. The obtained signal was analysed using wavelet transformation to establish a relationship with the group velocity to localise the simulated crack. From the investigation, it was found that the optimum placement of the sensor was between 75 mm to 375 mm for a 1.9 m length of rail section in laboratory conditions.

**Keywords:** [AE technique cracks & cracking damage localisation rail section railway tracks sensors](#)

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