

## PREDICTION OF THE DYNAMIC RESPONSE OF VEHICLES TO LATERAL TRACK IRREGULARITIES

Equations of motion are set up to predict the response of a 2-axle railway vehicle to track with specified irregular lateral and cross level alignment. Both creepforce - creepage and geometric non-linearities are included in the wheel-rail contact model and a simple flexible rail model is used. The equations are solved by time-stepping integration.

An experiment is described in which an instrumented test vehicle was run over a specifically installed lateral track irregularity representing a switch entry. The results are compared with theoretical predictions.

Vertical and pitch freedoms for the vehicle body have been included and the facility for introducing vertical track irregularities added. Predictions are given for a vehicle traversing a particular vertical and lateral misalignment combination that resulted in a service derailment. The theory indicates a situation likely to cause derailment within a metre of the site of the actual derailment.