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Poster 6

The effect of steel microstructure on damage mechanisms at the wheel-rail interface



James Ayabina

AUTHOR OF POSTER:
James Ayabina

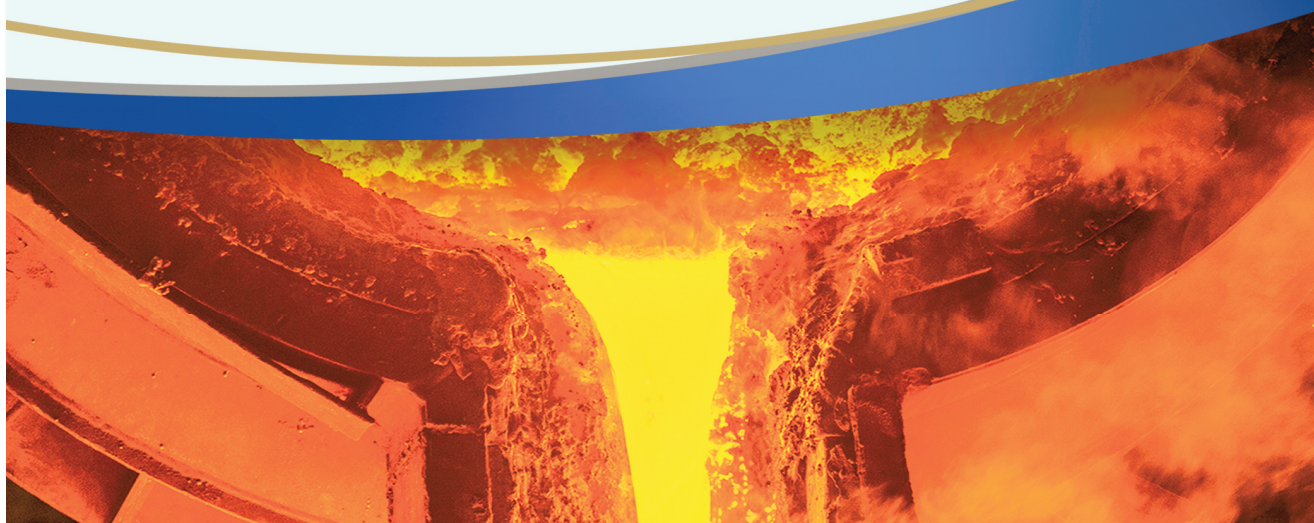
INSTITUTION:
The University of Sheffield

OTHER AUTHORS:
Professor Roger Lewis, The University of Sheffield
Professor Klaus Six, Virtual Vehicle Research Institute, Austria

ABSTRACT:

The microstructure of the steel at the wheel-rail interface plays an important role in the way wear and rolling contact fatigue occurs. The extreme loading experienced over a contact patch area that is about the size of a twenty pence coin leads to contact pressures occurring locally in the wheel material that are above the yield strength of the steel.

This combined with shear as a result of friction in the contact leads to the creation of a highly plastically deformed layer up to about 100 microns thick on the surface. It is here that wear and rolling contact fatigue mechanism are initiated. Layers are hard to extract from the actual in service material, so laboratory methods using a high pressure torsion (HPT) approach are being developed in this work to create layers in a more controlled way that can then be machined to very small specimens for FCG testing.



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