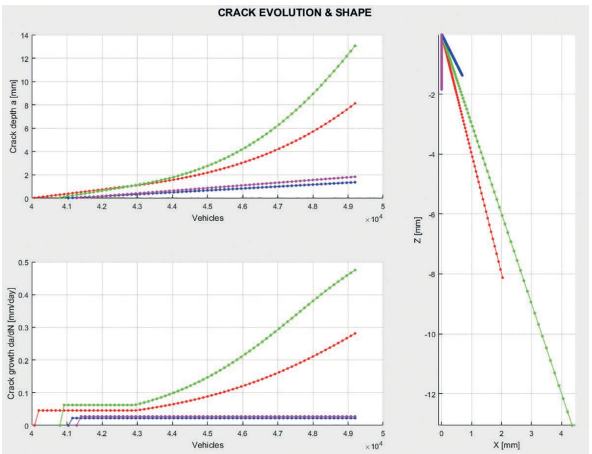
MATERIALS AND PROCESSES

MEMBER OF
BASQUE RESEARCH
& TECHNOLOGY ALLIANCE

DESIGN, MODELLING AND CHARACTERIZATION OF COMPONENTS AND PROCESSES

The railway industry is taking advantage of the ICT-based technology trends that lead toward digitization; the concept of "the digital train" is increasingly being implemented under the influence of Industry 4.0. Nevertheless, trains still circulate over rails and bear substantial similarities between rails and wheelsets from over 100 years ago. Our solid knowledge in metal materials science helps our customers manufacture better, more durable and safer components.

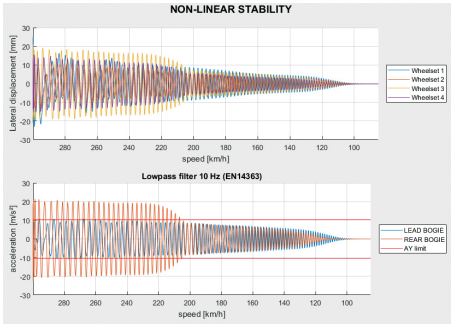


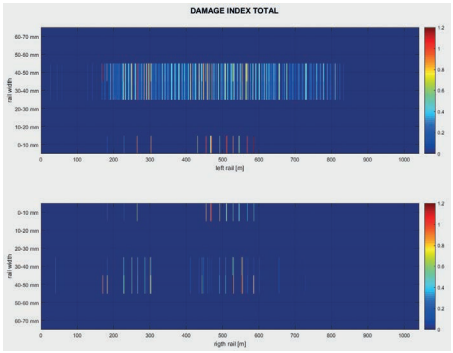
AD-HOC SOLUTIONS

- Improvement of steel grade, processing and heat treatment of rails, wheels and axles for fulfilling high mechanical requirements.
- Characteristic assessment, metallurgy processes and life prediction of switches and crossings.
- Fatigue crack propagation analysis.
- Wear resistance and toughness.
- Bearing steels and heat treatments for improved bearing quality.
- Sintered metal matrix brake pads for high speed trains.
- Quality control, defect characterization, degradation, in-service inspection.

KNOWLEDGE AND EXPERTISE

- Fatigue analytics and numerical modeling.
- Testing capabilities and microstructural characterization.
  - Nondestructive testing, e.g. magnetic Barkhausen noise measurements, BNA analysis, magnetic flux leakage measurements, etc.
  - Destructive testing, e.g. optical and electronic microscopy (FEG-SEM, EBSD, STEM, FIB), X-ray diffraction, on-site mechanical testing.
- Analysis of steel grade, processing and heat treatment.
  - Steel cleanness (inclusions).
  - Forging conditions.
  - Microstructure after heat treatment (microstructural homogeneity).
  - Final mechanical properties analysis (strength and toughness).





PARTNERS & CUSTOMERS

ArcelorMittal · CAF · PANDROL · VIAS · DB · JEZ · adif · tecnice

PROJECTS

eaTS · TREND · ECUC www.ecuc-project.eu · Roll2Rail · ERSAT · SIA SYSTEM FOR VEHICLE-INFRASTRUCTURE INTERACTION ASSETS HEALTH STATUS MONITORING · Shift2Rail · X2RAIL 1 · X2RAIL 2 · FR8RAIL · fr8hub

ceit
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

Paseo Manuel Lardizábal, 15
20018 Donostia-San Sebastián · Spain
+34 943 212 800

Parque Tecnológico de San Sebastián
Paseo Mikeletegi, 48
20009 Donostia-San Sebastián · Spain
+34 943 212 800

www.ceit.es/railway
ceitrailway@ceit.es