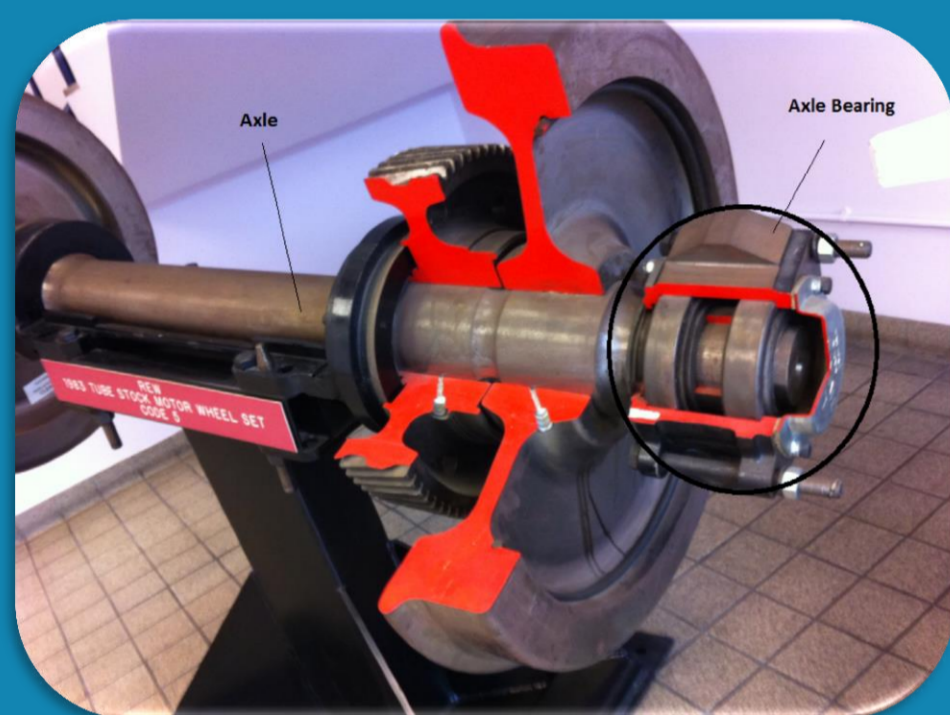


## The Problem

Train wheelset faults are not always controllable. They can contribute to unnecessary operational costs and result in catastrophic failures.

The high-speed train involved in the Eschede accident, in Germany, 1998



Train Wheelset – London Underground Acton Town depot



Most common bearing defects

## Solution

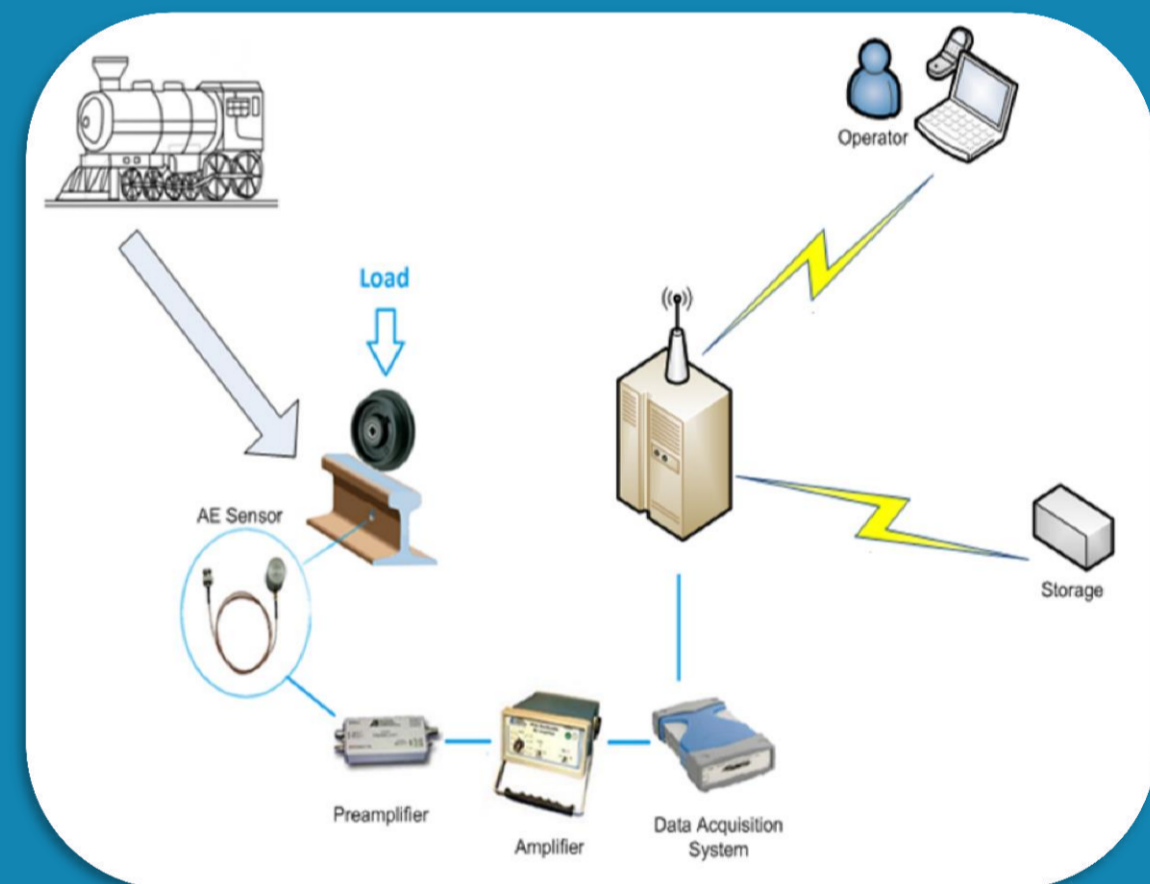
Developing a novel online system for the reliable condition monitoring of railway wheelsets. This project aims to develop an online technique based on acoustic emission to detect and evaluate wheelset defects at an early stage, before they result in damage being inflicted to other components as well as catastrophic failure.

## What is Acoustic Emission ?

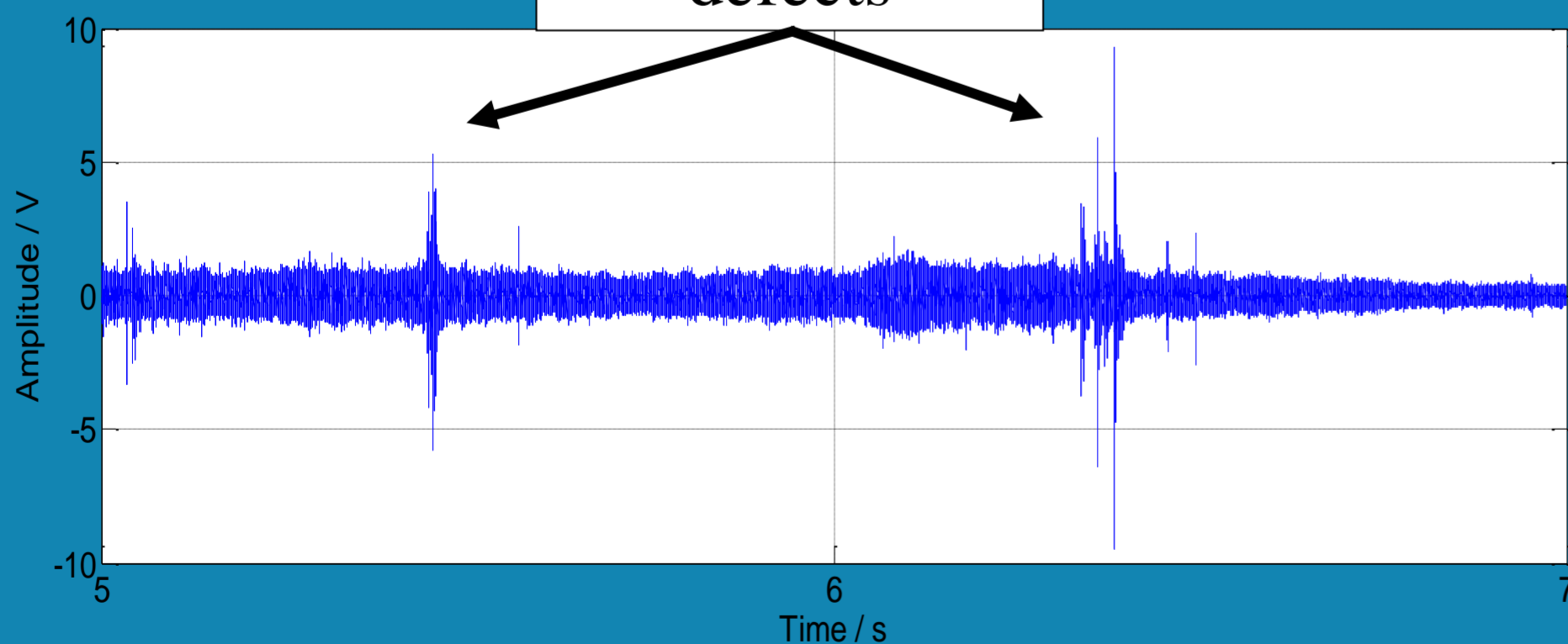
Acoustic Emission is defined as the generation of *elastic waves* made by a sudden redistribution inside or on the surface of a material. When an external stimulus such as temperature or load subjects on a material is present, the released energy will be in the form of stress waves and can be recorded by sensors. Defects can also act as Sources of Acoustic Emission.

## How Does it work ?

Signals after being caught by an acoustic transducer and amplified are acquired using a data acquisition board . There signals are then further processed in both time and frequency domain using Matlab software.



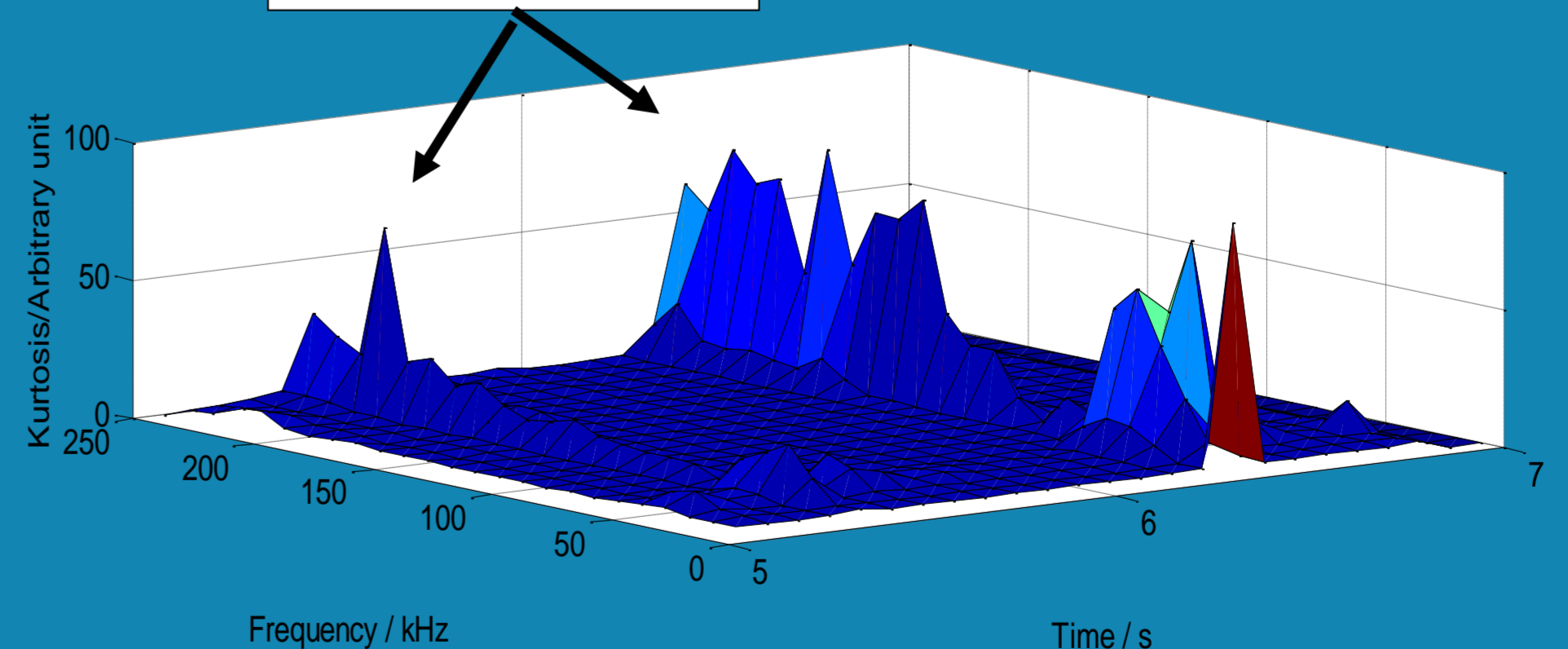
## Roller bearing defects



Raw acoustic emission data from wayside field test presenting defective bearings passing by the sensors

## Results

## Roller bearing defects



Time spectral Kurtosis diagram of acoustic emission data from wayside field test

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