Master Thesis

Title of the Thesis

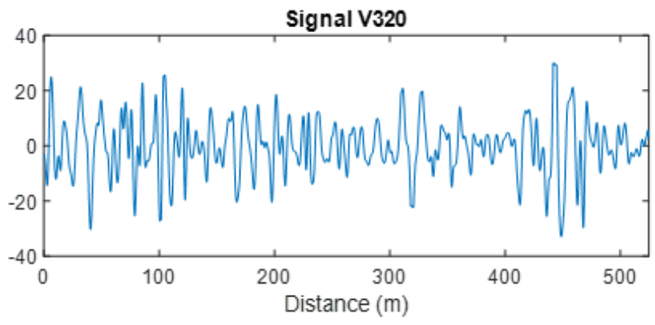
Characterization of Light Rail Tracks through Fractal and Frequency Domain Methods

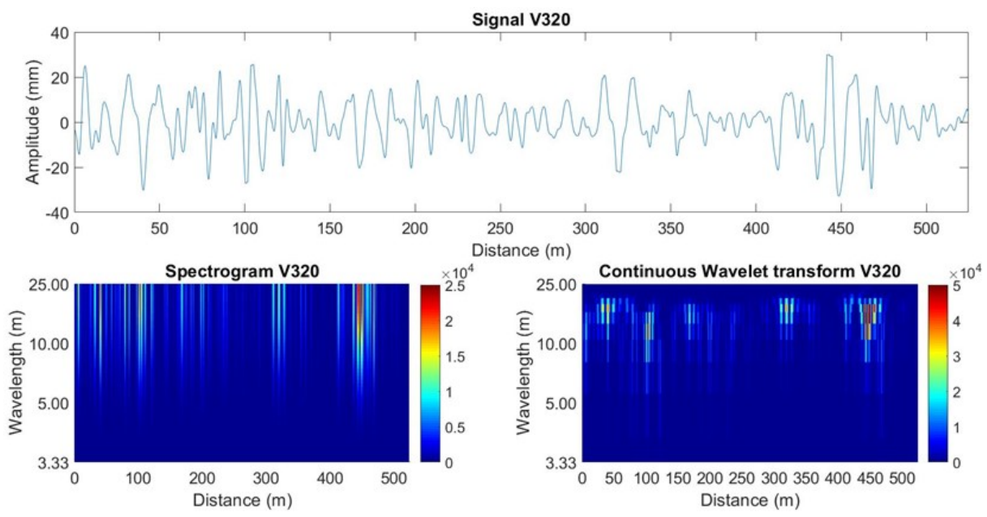
Abstract

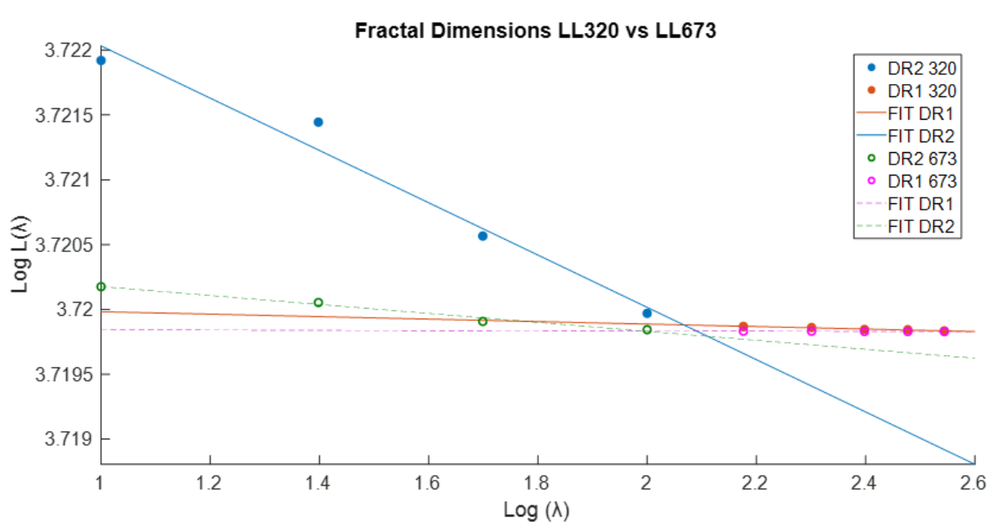
Irregularities in light railway tracks influence the running behavior of trains, affecting comfort, safety of passengers and in some cases involves derailment. Thus, it is important that track irregularities are identified and criteria for track irregularities are adequately established. Frequency domain methods as Short-time Fourier and Wavelet Transforms, help to find track irregularities in form of wavelengths which are in the track at the moment of evaluation. Also, Fractal Analysis is used for indication of track geometry providing numerical values that characterize railway track geometry patterns. These three methods aim to potentially provide information about the actual condition of the track by precise quantification of the geometry.

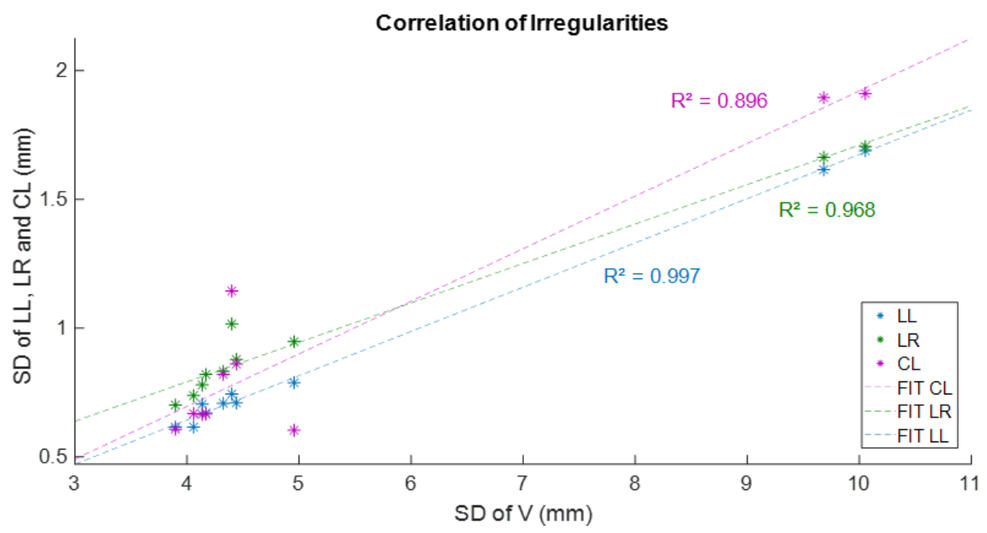
Foto: Alberto A. Alvarez P.

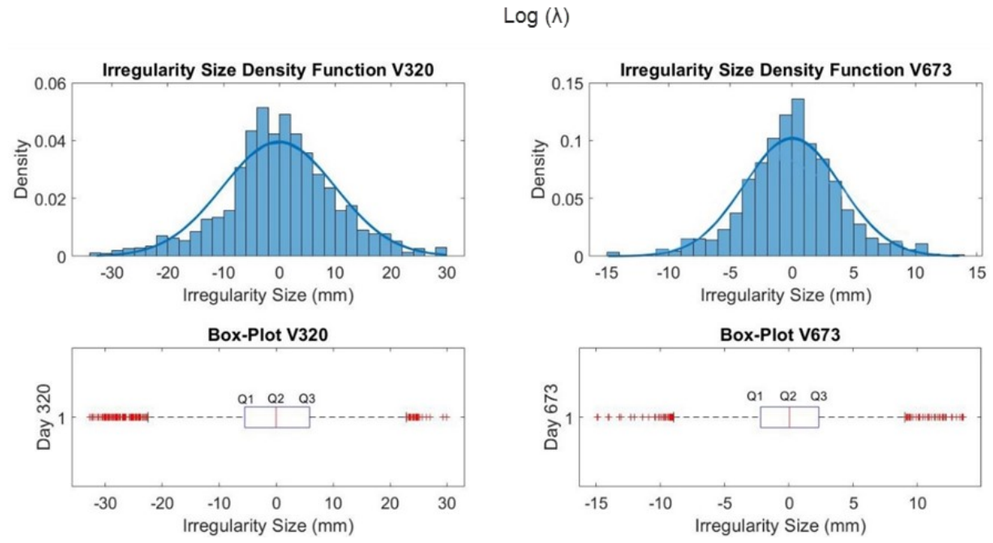
This thesis deals with light rail irregularities appearance in form of short Wavelengths (3 to 25 meters) from measurements carried out on a light railway track by Stuttgarter Straßenbahn (SSB) in the city of Stuttgart. The thesis describes the results of the characterization of the track geometry of a railway track through Fractal and Frequency Domain methods.











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