



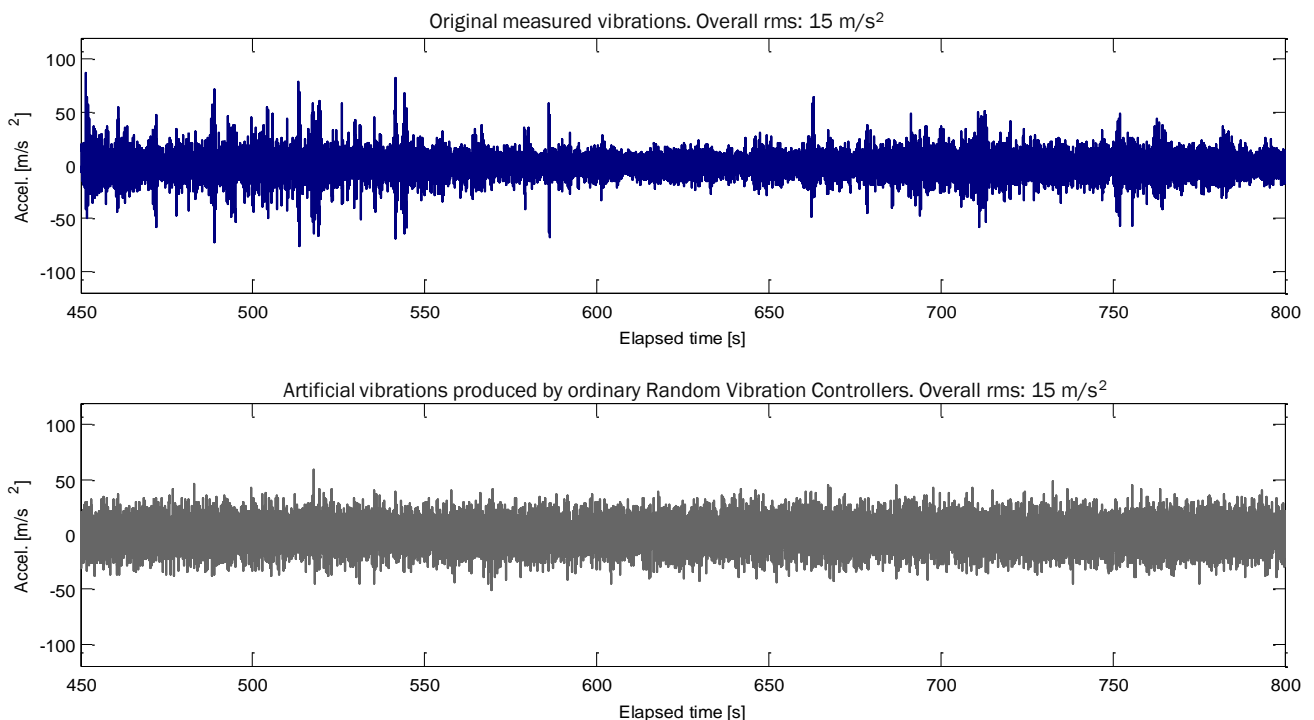
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## Statistical Vibration Synthesizer

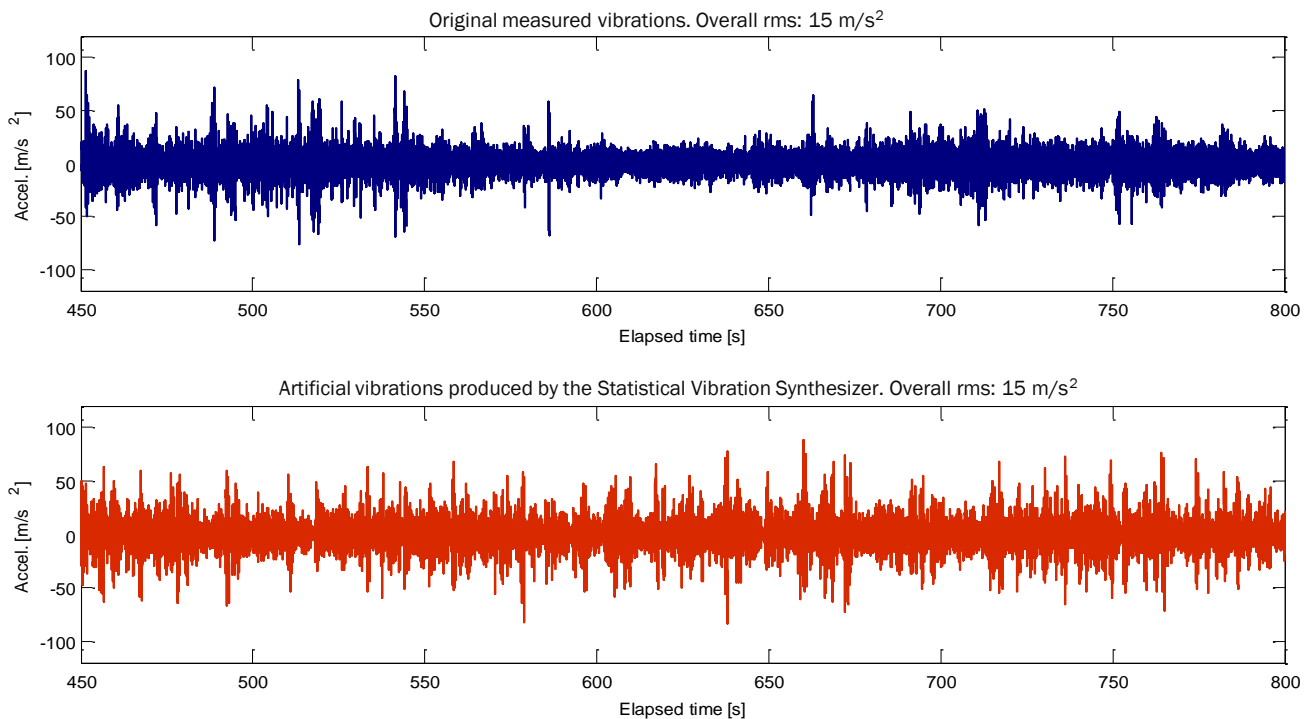
### Introduction

The fact that the intensity of the vibrations produced by vehicles is not constant is being more widely recognized. This statistical nonstationarity is attributable to variations in pavement roughness and vehicle speed along a particular route. This distinctive feature of road vehicle vibrations has long been established but, but because of apparent difficulties in dealing with nonstationary signals, random vibration controllers only generate stationary - steady state root-mean-square (rms) - vibrations.

As illustrated below, the most dramatic consequence of using ordinary Random Vibration Controllers is the absence of fluctuation in rms level of the vibrations – despite the fact that the overall rms is the same as that of the original measured vibrations.



The Statistical Vibration Synthesizer (SVS) offers a practical solution to this problem. Based on years of University research, the Statistical Vibration Synthesizer converts your current random vibration test system into one that can reproduce the random fluctuations in rms that are so typical of vehicle vibrations.



As shown above, the important advantage afforded by the SVS system is that it re-creates the occasional large excursions in vibration intensity that are clearly present in the original vibration record. Listen to the difference (signals played back at higher rates for audibility):

- Steady-state vibrations from ordinary RVC (20 s): [Play Sound](#)
- Nonstationary vibrations from system with SVS (20 s): [Play Sound](#)

These all-important random fluctuations are achieved by combining the rms distribution of the vibrations with the average PSD to synthesize nonstationary, non-Gaussian random vibrations.

The SVS system comes as a stand-alone module, designed to replace ordinary Random Vibration Controllers, or as an RVC adaptor module, designed to effortlessly connect with your existing random vibration controller so that there is no need to dispose of your current system.

The SVS system enables you to generate laboratory tests that are true statistical representations of your distribution environment instead of just the average. This offers significant advantages in achieving true package and product optimisation thus reducing cost and waste.

Some features of the Real Vibrations Statistical Vibration Synthesizer Stand alone and RVC adaptor modules are:

- Fully compatible with existing random vibration controllers and vibration test systems
- Easy to connect, install and use
- Uses Microsoft Excel® to manage all PSD and statistical data
- Intuitive to use – designed by engineers for engineers
- Includes easy-to-use help facility for practical guidance
- Includes facilities to import and analyse field data captured with Saver® units
- Incorporates a Vehicle-trip synthesizer module

A guided tour of the Statistical Vibration Synthesizer system is available from the Real Vibrations web site at [www.realvibrations.com](http://www.realvibrations.com).