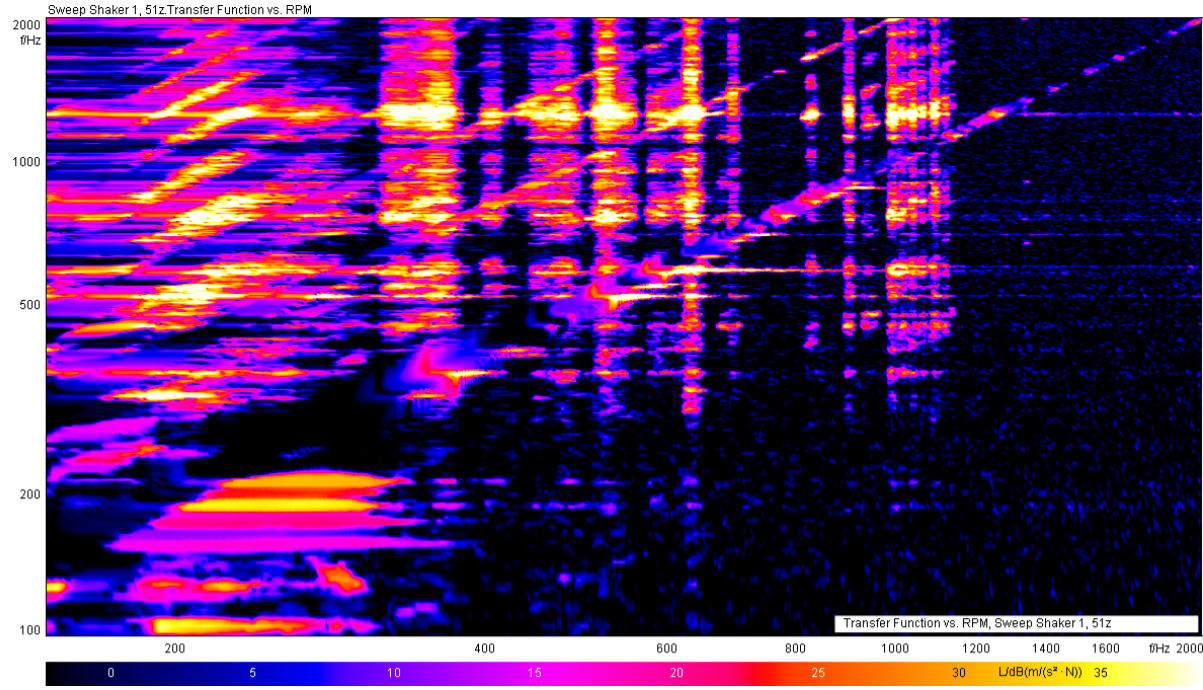
HEAD acoustics

DATA SHEET



ArtemiS SUITE
Signal Processing

Code 51202

ASP 202 System Analysis vs. Control Channel

System Analysis vs. Control Channel of ArtemiS SUITE provides analyses for examining dynamic systems which can be calculated depending on different control channels (RPM, force, ...).

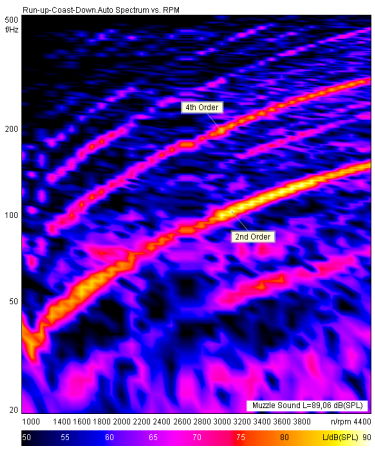
OVERVIEW

ASP 202 System Analysis vs. Control Channel

Code 51202

System Analysis vs. Control Channel enables users to perform system analyses versus a number of different control channels.

The most common case is the representation versus rotational speed (RPM). In addition, System Analysis vs. Control Channel also offers the possibility to display analysis results versus any analog channel contained in the file. That way, it is possible to show the dependency of other signal levels such as force or temperature.



KEY FEATURES

System Analysis vs. Control Channel includes several system analyses, which can be calculated versus RPM, force, temperature, or other control channels

- Impulse Response vs. RPM
- Transfer Function vs. RPM
- Auto Correlation vs. RPM
- Cross Correlation vs. RPM
- Auto Spectrum vs. RPM
- Cross Spectrum vs. RPM
- Coherence vs. RPM
- Harmonic Distortion vs. RPM

The analyses can be used in Pool Projects (APR 010 is required), Automation Projects (APR 050 is required), Standardized Test Projects (APR 220 is required), and Metric Projects (APR 570 is required)

APPLICATIONS

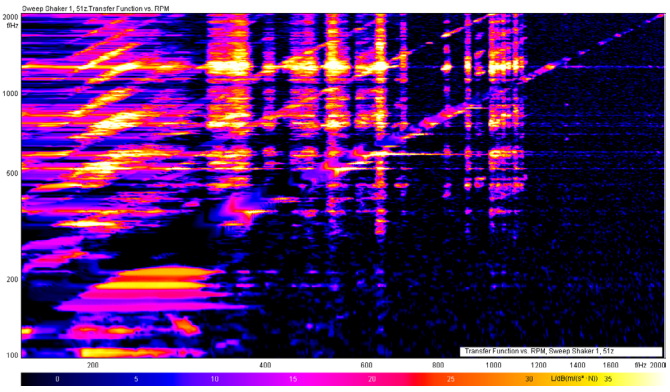
- Examination of the dynamic system characteristics
- ...

DETAILS

Transfer function

The transfer function describes the dependency of the output on the input of a linear time-invariant system in the frequency domain.

The analysis Transfer Function vs. RPM calculates the transfer function from two channels of an input signal or from one input and one reference signal versus a control channel.



Transfer Function vs. RPM

Impulse response

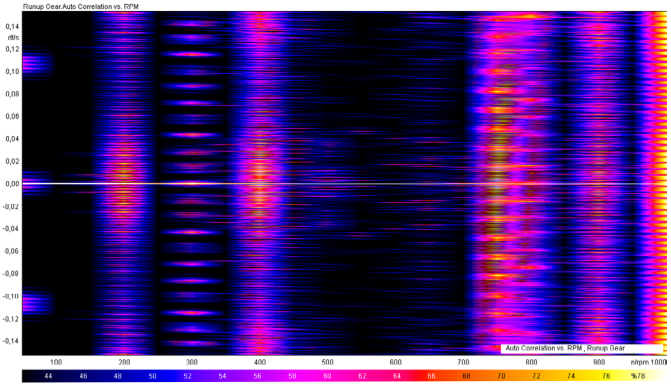
The impulse response describes the transfer function in the time domain with the help of the response to the elementary signal "impulse". This analysis is used to examine the similarity of a signal with equally long parts of a reference signal in the time domain.

The analysis Impulse Response vs. RPM calculates the impulse response from two channels of an input signal or from one input and one reference signal versus a control channel.

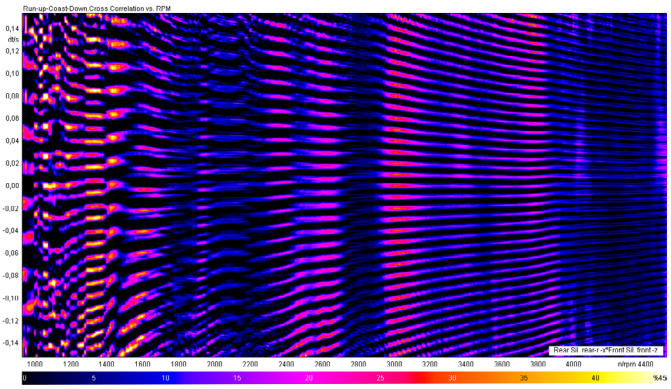
Correlation

The analysis Auto Correlation vs. RPM calculates the auto correlation function of an input signal versus a control channel. The analysis examines two input signals to find corresponding components and to shift the signals against each other. This analysis can used to calculate the self-similarity of a signal in the time domain, what makes them particularly suitable for detecting periodic signals or echoes, for example.

The analysis Cross Correlation vs. RPM calculates the cross correlation function of an input and a reference signal versus a control channel. The analysis can be used to examine the similarity of a signal with equally long parts of a reference signal in the time domain. Therefore, a similarity value of two signal parts just like the auto correlation analysis is calculated. But while the latter examines two identical signals, the cross correlation analysis uses two different signals shifted to each other by a shift time.



Auto Correlation vs. RPM



Cross Correlation vs. RPM

Auto spectrum

The analysis Auto Spectrum vs. RPM calculates the auto spectrum of an input signal versus a control channel.

Cross spectrum

The analysis Cross Spectrum vs. RPM calculates the cross spectrum of an input and a reference signal versus a control channel.

Coherence

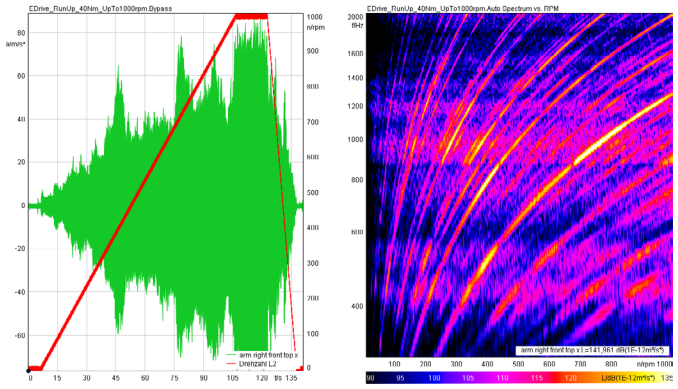
The analysis Coherence vs. RPM calculates the coherence between two channels of an input signal or an input and a reference signal versus a control channel.

The analysis can be used to measure a linear dependency between two signals versus frequency and is represented as percentage value. The calculation is performed from auto spectrum and cross spectrum and the result is then plotted versus the frequency.

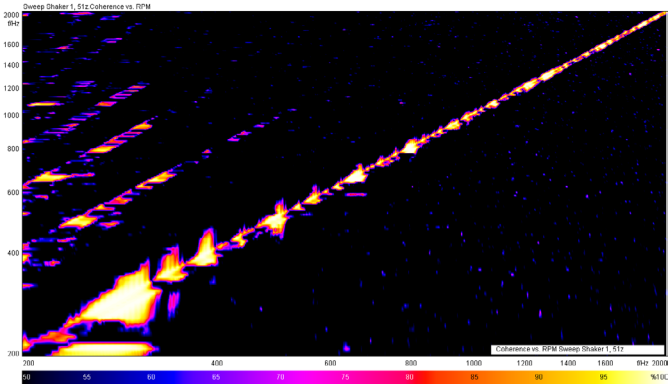
Harmonic distortion

The harmonic distortion represents the degree of nonlinear distortion of a signal during a transmission. To measure the nonlinear distortion, a sine signal is sent across the transmission chain and afterwards the output signal is related to the original signal. A differentiation is made between harmonic distortions, which are usually caused by overmodulation of the signal, and noise.

The analysis Harmonic Distortion vs. RPM calculates the harmonic distortion of an input signal versus a control channel. For this purpose, the corresponding FFT spectrum is calculated for each revolution speed. Therefrom the particular harmonic distortion single value is calculated and displayed in the result diagram.



Auto Spectrum vs. RPM



Coherence vs. RPM

Required: APR Framework (Code 50000)

and/or: HEAD System Integration and Extension (ASX) programming interfaces

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Contact Information

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