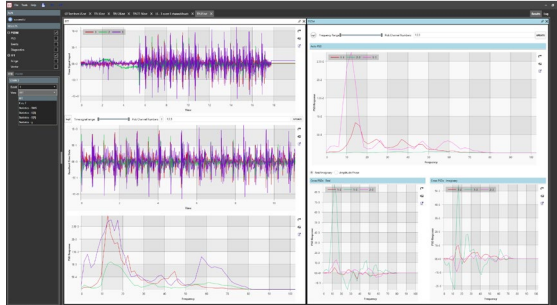# MSC **CAEfatigue – Industry Solutions for Testing Departments**

Product Overview

*CAEfatigue (Cf)* is a package of software products that cover the topics of Fatigue, Random Response, Loads Management and Test Design. It is a *modern alternative* to existing software**,** which is both *Customer Driven* and *Technically Innovative*. The software also provides an embedded *Technical Transfer* training package with 100's of hours of training by Dr Neil Bishop.

Cf PREMIUM is one of 4 packages within the software that preforms frequency domain loads management and test design calculations with static or dynamic systems created within Nastran, Abaqus, Optistruct, or Ansys FE environments.

- • Cf TIME
- • Cf RANDOM
- • Cf FREQUENCY
- • Cf PREMIUM

Cf PREMIUM includes all the capabilities of *TIME, RANDOM* and *FREQUENCY*.

Features
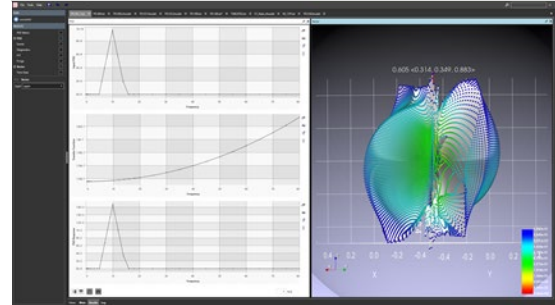
- • *Loads Cascading to create loading profiles at internal structural locations like battery trays.*
- • *Surrogate Load Analysis* to create simplified loading profiles for use in test.
- • *Loads Enveloping* to create representative vibration environments from multiple events and channels.
- • *Psuedo Damage* analysis on measured responses like accelerations.
- • *Vector* load capability to create directional vibration loading vector from triaxial transfer function data.
- • Advanced *Loads Conditioning* to transform time data into its equivalent frequency domain form or to simply time data without affecting the damage output.

Case Studies
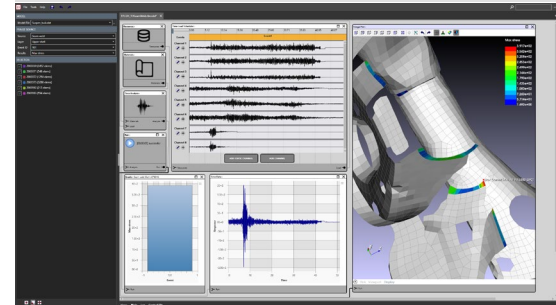
2020, *Vector Load Simplified Duty Cycle for Lower Control Arm*. SAE World Congress paper 2020-01-1058. Work done with *FCA, Canada*, on test design simplification and surrogate loads analysis.

2020, *Loads simplification on multi-input axle systems*. SAE World Congress paper 2020-01-1056. Work done with *GM Brazil, and GM US*, on loads simplification and surrogate loads analysis.

2020, *Frequency Domain Loads Processing for Exhaust Systems*. SAE World Congress paper 2020-01-0180. Work done with *Ford, Brazil and Ford, US* on loads simplification and surrogate loads analysis.

Typical Use Cases

- • Automotive parts and systems subjected to random or time varying loads (e.g., *Radiators, Cooling Systems*).
- • All *Ground Vehicle* Systems such as excavators, military vehicles etc.
- • *HVAC systems* subjected to vibration loads, with or without additional deterministic loads.
- • *Wind Energy* systems including the rotor and all drive systems.
- • *Offshore Platforms and Systems* subjected to wave, wind or mechanical loading.
- • *Marine Systems* such as subsea pipeline systems.
- • *Rail Systems* subjected to track loads.
- • *Consumer Products* like power tools and washing machines subjected to vibration loads.
- • *Printed Circuit Boards* durability.
- • Longevity of *Medical Products*.

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