

## Generative Dynamic Response Analysis (GDY)

**Interactive capability to predict and analyze the dynamic response of a system**

### Overview

While GPS and GAS allow designers to understand the vibration characteristics of their designs by calculating the modes and natural frequencies, GDY takes this a step further by allowing users to study the response of their designs to dynamic loading. This allows designers to ensure early in the design phase that their designs do not suffer from resonance and other dynamic effects.

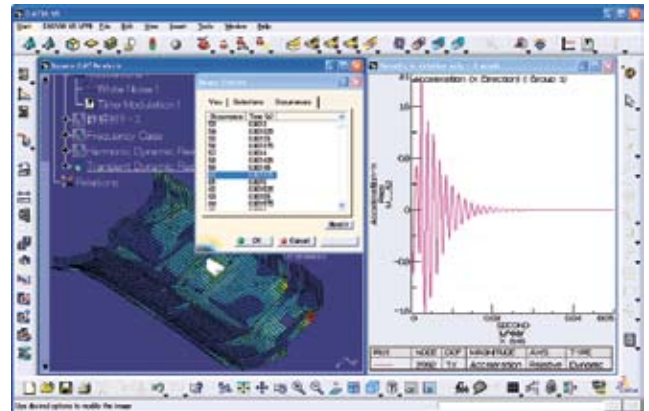
GDY provides both transient and harmonic analysis. Transient analysis allows the response of the structure to be determined for loading that varies quite generally with time. Harmonic analysis allows the response of the structure to be calculated for loading that varies with frequency.

### Product Highlights

- Extends Generative Part Structural Analysis (GPS) with dynamic response analysis.
- Provides forced transient and harmonic response analysis.
- Benefits from the unique native and associative CAD/CAE integration.
- Provides efficient tools to interpret and understand the dynamic behavior of designs.



GPS is the backbone of the CATIA V5 Analysis solution. The other five CATIA Analysis products are combined with GPS to extend its integrated analysis capabilities.



Transient response analysis with restraint excitation

## Features and Benefits

In addition to the functionalities and benefits provided by Generative Part Structural Analysis (GPS), Generative Dynamic Analysis (GDY) offers:

### Unique native and associative CAD/CAE integration

GDY is an easy-to-use tool tailored to designers and design engineers. As one of the CATIA Analysis products, users can easily predict the dynamic response of designs in a consistent user interface at any time in the design process. Dynamic analysis can be performed on solid, surface, and wire frame geometry, as well as hybrid assemblies. The association of the analysis specifications, such as loads and restraints, with the design allows users to work quickly and consistently. With GDY, designers can ensure that their designs are sized appropriately for dynamic loading early in the development cycle, saving time and improving quality.

### Provides forced response in the time and frequency domain

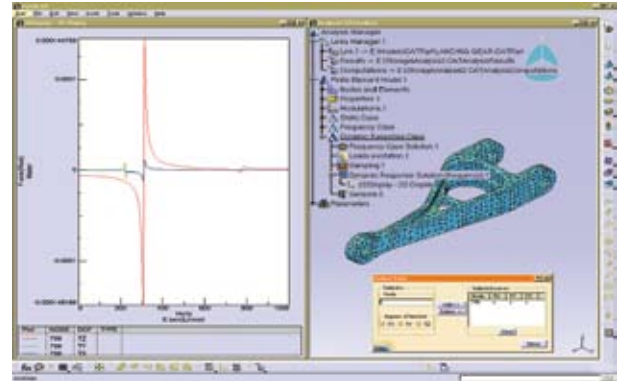
GDY can analyze the dynamic response of the structure in either the time or frequency domain. Time domain, or transient, analysis allows the time variation of the loading to be defined and GDY calculates the transient response of the structure, the output typically being the time variation of the displacements and stresses in the structure. Frequency domain, or harmonic, analysis allows the frequency variation of the magnitude of the load to be defined. GDY assumes the loading varies harmonically and calculates the magnitude of the displacements and stresses at each frequency. Excitation of the structure by dynamic motion of its restraints is also supported and both modal and Rayleigh damping can be defined to represent the energy absorption of the structure as it vibrates.

### Efficient modal solution method

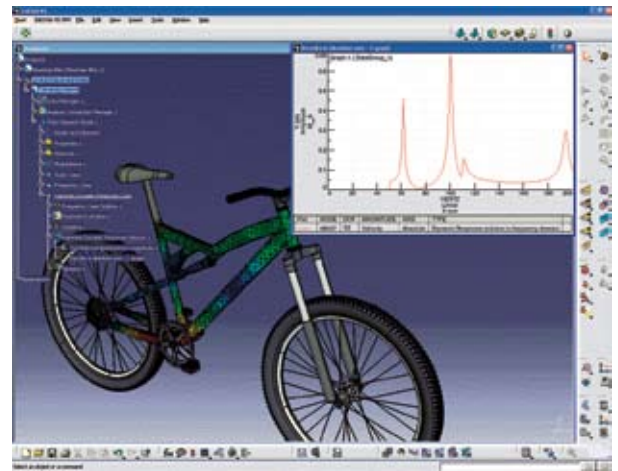
GDY uses an efficient modal superposition technique to calculate the dynamic response. This allows the rapid solution of many load cases, but requires that the response of the structure is linear.

### Tools to easily interpret the dynamic response

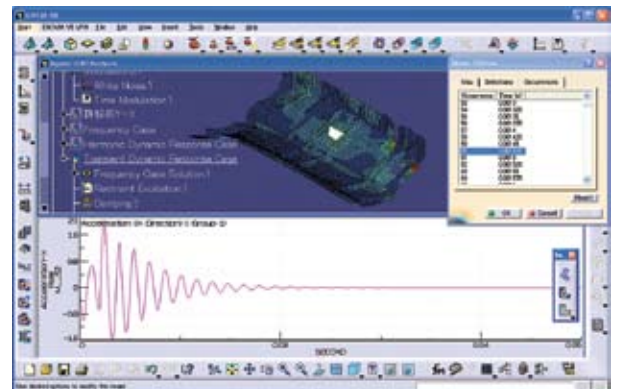
GDY provides a number of tools to help visualize and interpret the dynamic response of the structure. These include animation of the deformation of the structure and of contours of the displacements and stresses, as well as the ability to plot curves showing the time or frequency variation of the response at points on the structure.



Harmonic dynamic analysis of a landing gear part



Harmonic dynamic analysis of a mountain bike frame: contours of displacement magnitude and frequency variation of velocity



Transient dynamic analysis of a stiffened panel excited at its restraints

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