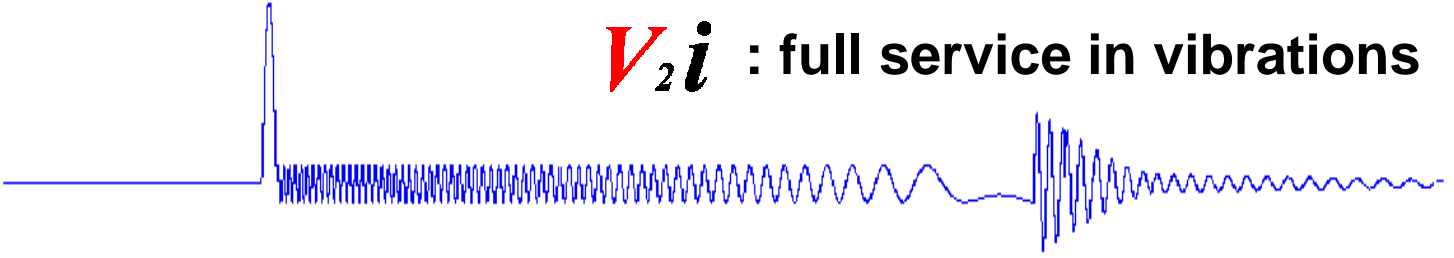


V₂i

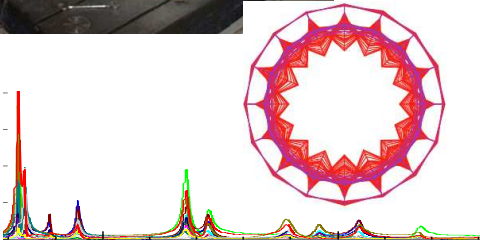
*from Vibrations
to Identification*

V₂i : full service in vibrations



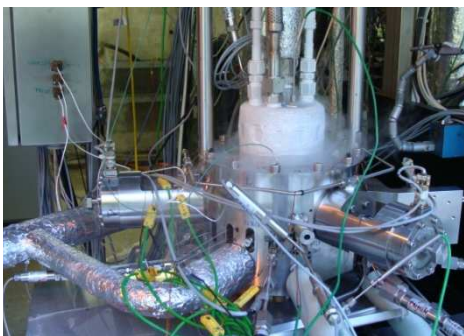
V2i provides a full range of services in the field of mechanical vibrations :

- based on the researches of international repute of the University of Liège in the field of structural dynamics;
- continuously improved and updated in close collaboration with the Department of Aerospace and Mechanical Engineering; one of the pioneering research team of the development of the Finite Element method (since the early sixties) and more than ten years of expertise in the field of experimental techniques.



Numerical Modelling & Experimental Testing

Thanks to those complementary expertises – *numerical modelling & experimental testing* – and thanks to innovative tools, V2i offers the necessary integration of simulation and testing to customers.



Optimal Efficiency

V2i answers industrial desire to have one single qualified partner addressing vibration problems, from initial CAD design to product certification, in order to find the optimal solution concerning :

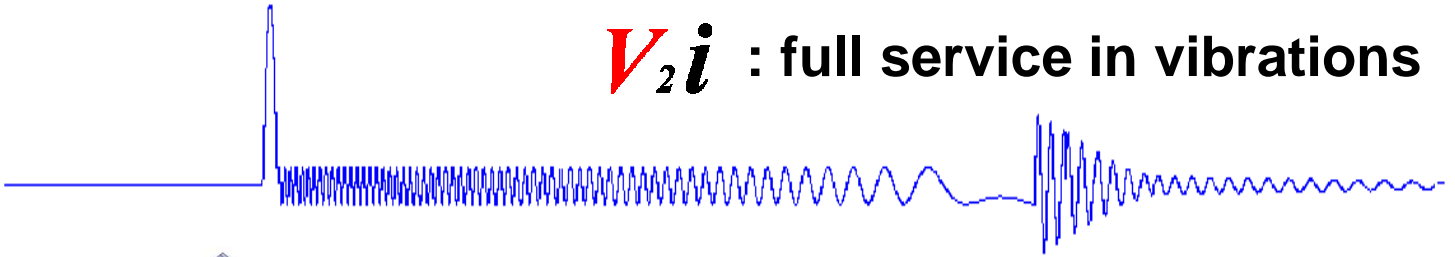
- structural design
- mechanical reliability
- product compliance
- safety
- project efficiency

V₂i

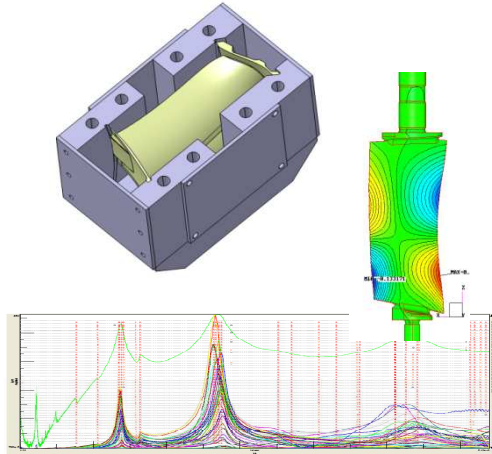
*from Vibrations
to
Identification*

Parc Scientifique du Sart-Tilman
Rue des Chasseurs Ardennais
4031 Angleur – Liège -Belgique
Tél. : 32 (0)4 361 59 66
32 (0)4 361 59 67
Fax.: 32 (0)4 361 59 68
E-Mail : d.simon@v2i.be
www.v2i.be

V₂i : full service in vibrations

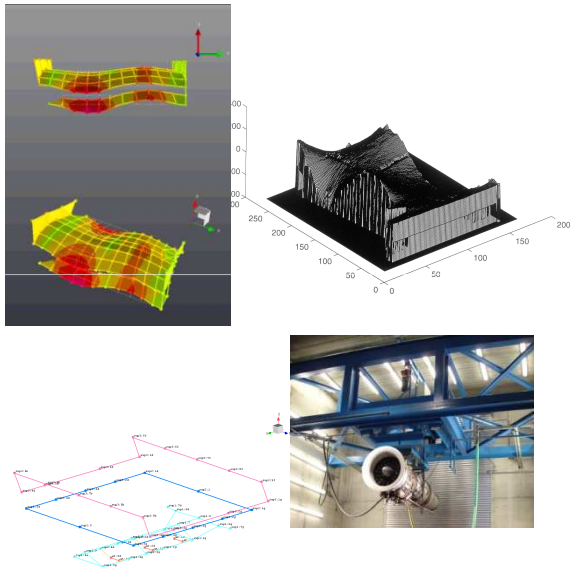


FE Modelling / Testing



- FE modelling and simulation (harmonic, time response, spectral)
- Link to Experimental modal analysis
- FE model updating
- Life-time prediction
- Identification of failure process
- Simulation of shaker testing (including the tools)
- Optimisation of the experimental analysis set-up

Experimental Modal Analysis



- In the laboratory or 'in situ'
- From very small structures (MEMS) to very large ones
- Very large panel of equipments
- Possible link to F.E. model
- Complete analyse an explanation of the results

Shaker testing



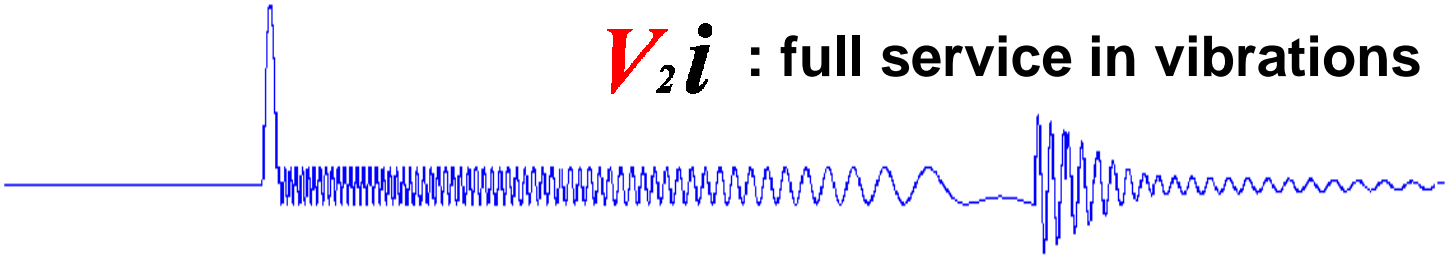
- Wide range of facilities (electrodynamics, hydraulic, piezo....)
- Sine, random, combined, shocks, ... With notch and multichannel control
- Combined with heating and/or humidity
- Large number of measurements/ctrl channels

V₂i

*from Vibrations
to
Identification*

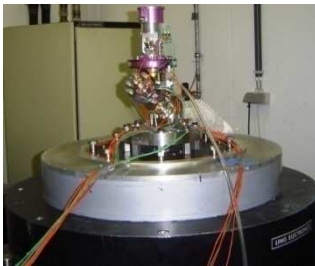
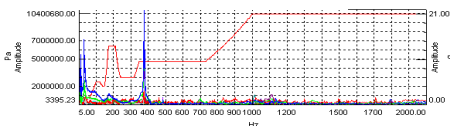


V₂i : full service in vibrations



Services with Shaker Testing

- Real time health monitoring during shaker testing
- Modal masses identification
- Expertise in vibration international standards
- Definition of an accelerated fatigue testing from the real environment harshness
- Vibration tools design & manufacture
- Combined temperature/humidity and vibration
- Special bench design
- Shaker testing simulation



High Cycle Fatigue testing

- Combined with heating (up to very high temperatures) and humidity
- Fatigue above 10 KHz
- Long duration with full automatic control
- Design and manufacture of the tools
- Definition of test specifications
- F.E. simulations and life time prediction
- Experimental S-N curves of test specimens on shaker (staircase, probit, ...)

V₂i

*from Vibrations
to
Identification*

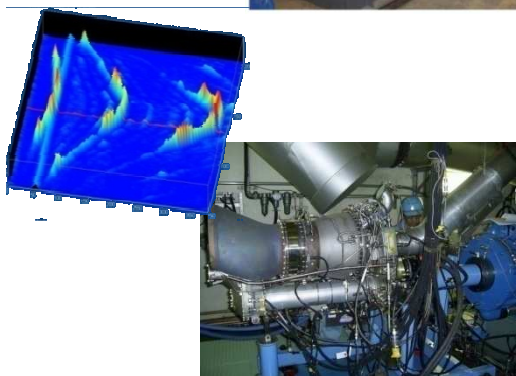
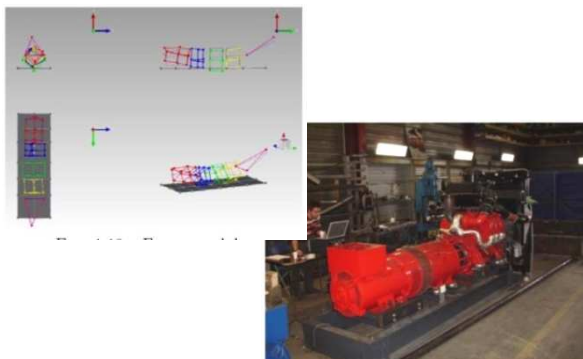
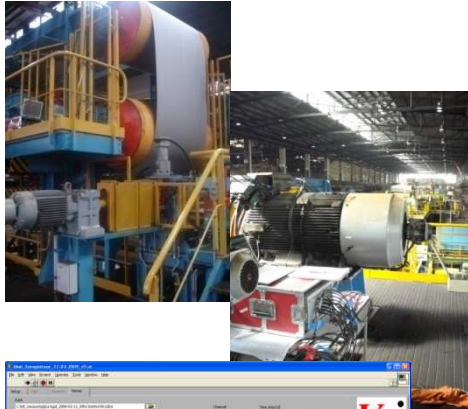
V₂i : full service in vibrations

Equipment & Structure Health Monitoring

- Long term measurements (triggers, coupled to process, ...)
- Measurements transmission
- Tools for continuous and real-time analysis
- Specific hardware and software
- Instrumentation 'in situ'

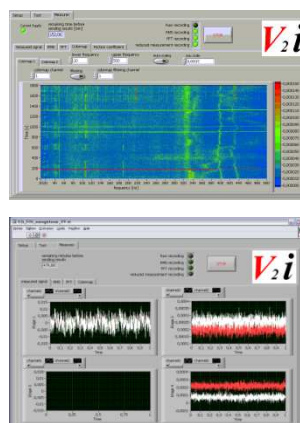
Tools for vibrations monitoring

- Hardware and software (including instrumentation)
- Build under customer requirements
- Automatic tools for analyses
- Low cost
- Partnership with N.I.
- Examples of softwares conception :
 - Long term monitoring (bearing, process, excitation, ...)
 - Rotating shaft monitoring (alarm, emergency stop, ...)
 - Rotor balancing
 - Vibration measurement and analysis
 - Remote control of computer
 - Shock measurements
 - 'Rainflow' counting for total damage estimation
 - Automatic scanning of small pieces.

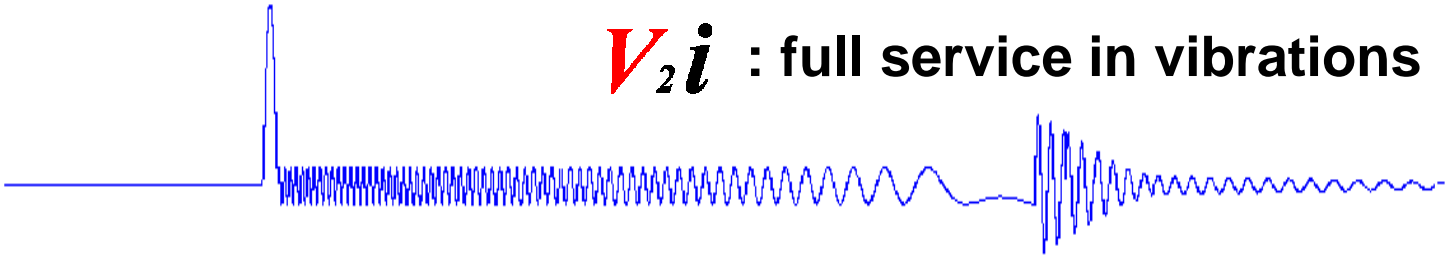


V₂i

*from Vibrations
to
Identification*



V₂i : full service in vibrations



R&D programs

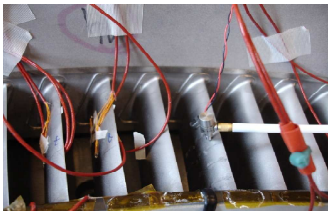
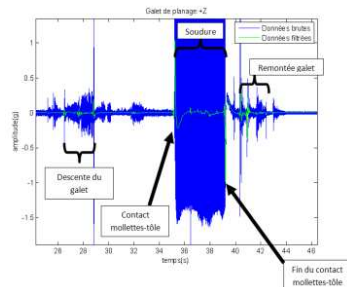
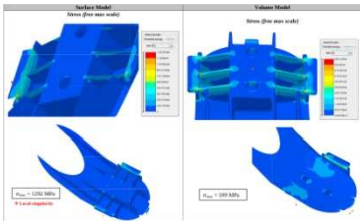
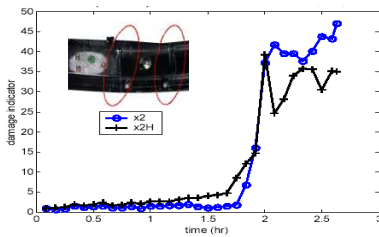
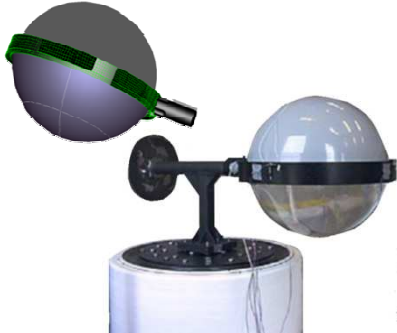
- Structural Damage Detection and real time Health Monitoring
- Identification of Non-Linearities in Structural Dynamics
- Shaker Vibration Testing and Fatigue Analysis of Mechanical Structures
- Fatigue analysis with probabilistic approach on material properties
- Modelling and simulation of Micro-Electro-Mechanical Systems (MEMS)
- Machine tool monitoring

Design or analysis of mechanical structures

- Based on F.E. calculations
- Improve by all available measurements
- Fatigue prediction under random excitation
- Probabilistic approach on material properties

Instrumentation and Measurements

- Acceleration, displacement, force, torque measurements, strain, temperatures, I, V ...
- Multi-channels, synchronous
- Signal processing (dedicated software developed by V2i)
- Balancing
- Vibration harshness characterisation



V₂i

from Vibrations
to
Identification

