

Knowledge & Technology Transfer

COLLABORATION OPPORTUNITY / SERVICES

Metrology and Nanometer active vibration control

References

LAPP: <http://lapp.in2p3.fr/LAVISTA>

Description

- Nanometre Vibration Measurement and Analysis from 0,1 Hz to 100 Hz – in situ Ground Motion measurement
- Dynamic characterization of mechanical structures and modal analysis, Rigid and active support design.
- Nanometre Stabilization in a frequency range of 1 Hz to 100 Hz
- Particle beam simulations including vibration effects
- Prototype, low noise, high sensitivity sensor characterization capable of functioning in extreme conditions (magnetic field, radiation)

Technology and/or Application domain(s)

Mechanical structure dynamics, Metrology/ Instrumentation, Signal analysis, Automatics, Active Control, Vibration Measurements, Isolation, Stabilization

Keywords

Mechanics, Metrology / Instrumentation, Automatics, Vibrations, Accelerators, Beam technologies, Supervision & Security, Environment

Offering

- Expertise and know-how in Metrology and nanometre active vibration control
- Services : Vibration measurements
- Collaboration or Partnership for innovative sensor and/or actuator implementation compatible with LAViSta program

Contact in laboratory (LAPP – UMR 5814)

Laboratoire d'Annecy le vieux de Physique des Particules
Tel: +33 (0) 4 50 09 16 00
<http://lapp.in2p3.fr/>
Technology Transfer Officer : Frédérique Chollet
Tel: +33 (0) 4 50 09 16 44
email: chollet@lapp.in2p3.fr
<http://lapp.in2p3.fr/valorisation/>

Contact IN2P3 - Technology Transfer Office

email: partenariat.industriel@in2p3.fr
<http://valorisation.in2p3.fr/>

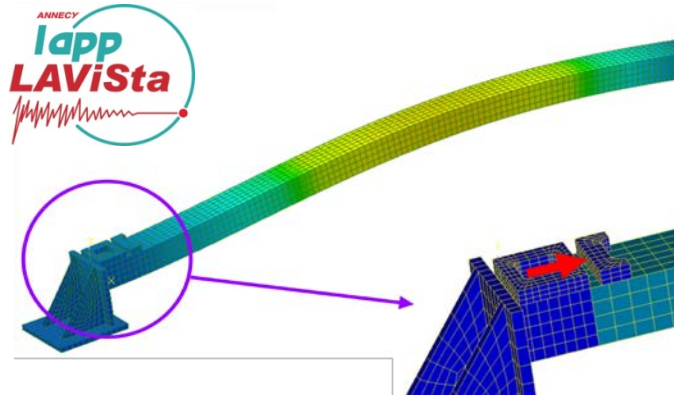


Figure 1: Modal analysis of a cantilever magnet prototype and details of the fixed part

State of development / Innovative aspects and main advantages

This know-how comes from the R&D on future accelerators. Stabilization is a feasibility, performance and cost issue for these projects having a nanometer (10^{-9} m) beam size at the interaction point.

The team has demonstrated subnanometre stabilization feasibility on a prototype magnet by combining an industrial isolation system and resonance compensation developed by the LAViSta team.

The team's know-how spans sensor integration, signal conditioning, acquisition system parameterization, vibration measurement analysis systems, and the study of the dynamical response of the mechanical structures used. The specificity of the know-how comes from a global approach of the system using a vast amount of competences in mechanical engineering, metrology, instrumentation and automatics.

The team has a variety of high quality instruments and a complete test bench.

Fields of application / Potential commercial applications

Accelerator, aeronautics, Aerospace
Instrumentation, Measurements, Detection, Control
Beam Optics, Material

Other applicants

LAPP collaborates with SYMME (Laboratoire des Systèmes et Matériaux pour la Mécatronique) from Université de Savoie and the Polytech network. International experts from CERN, SLAC (Stanford) and KEK (Japan) are also partners.