

## **Vibration issues on particle detector components during transport and in operation –Experimental approach**

*Wednesday 25 May 2016 09:00 (30 minutes)*

CERN's specialised structures such as particle detectors are built to have high rigidity, low weight and are very fragile. Shock and vibration issues are a key element for successful transport, handling operations around the CERN infrastructure, as well for operation underground. This talk will present results obtained over the last ten years of experimental modal analysis of tracking detector structures or sub-structures. This measurement technique is performed with the purpose of determining the fundamental frequencies, damping and mode shapes of light and fragile detector components. This process permits to confirm or replace Finite Element Analysis in the case of complex structures (with cables and substructure coupling). It helps solving structural mechanical problems to improve the operational stability and determine the acceleration specifications for transport operations. In the second part of the talk, the last vibration measurements performed around the ATLAS SCT-TRT barrel, and the last ground motion measurements around CMS experiment will be presented and discussed. Finally, an overview of advanced measurement techniques in the field of vibration and thermo-mechanical properties characterisation will be exposed.

### **Summary**

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