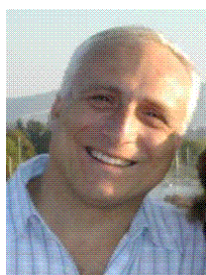


Beyond the Higgs boson hunting: high-performance instrumentation and measurement technologies for testing and tuning particle accelerators at CERN

Realizing and tuning the largest machine ever built by the human kind, the Large Hadron Collider (LHC) at CERN fostered a powerful challenge in advanced measurement technologies. As a matter of fact, LHC is the coldest massive site of the universe, with a vacuum level lower than free space (one tenth than the moon surface) and a temperature minor than the universe average. This target has been achieved by measuring several physical quantities in unexplored ranges, but, above all, by unprecedented precision.

In this talk, some of most interesting results of this technological research effort, as well as its further most recent development, are highlighted. In particular, after a short survey on high-precision measurement technologies contribution to the Higgs boson hunting, the presentation focuses mainly on state of the art of CERN research techniques based on fluxmeters and cryogenic dc current transformers for measuring magnetic fields and superconducting critical currents, respectively.



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His main research interests include high-precision digital instrumentation and transducers for measurements in particle accelerators, evolutionary diagnostics, distributed measurement systems, ADC modelling and testing. In these fields, he published 2 books, several book chapters, and more than 180 scientific papers in journals and national and international conference proceedings. His PhD students were awarded in 2006 and 2010 at IEEE I2MTC, and in 2012 at IMEKO World Conferences.