

Title: Superconducting magnet technology for particle accelerators and detectors

Lecturer: Mr. TAYLOR, T

Date and Time: 14th July at 10:15

Summary of the proposed talk

This lecture is an introduction to superconducting magnets for particle accelerators and detectors, the aim being to explain the vocabulary and describe the basic technology of modern superconducting magnets, and to explore the limits of the technology. It will include the following:

- Why we need superconducting magnets
- Properties of superconductors, critical field, critical temperature
- Why accelerators need fine filaments and cables; conductor manufacture
- Temperature rise and temperature margin: the quench process, training
- Quench protection schemes. Protection in the case of the LHC.
- Magnets for detectors
- The challenges of state-of-the-art magnets for High Energy Physics

Prerequisite knowledge and references

Only knowledge of basic physics is required **References Books:**

M. Tinkham, *Superconductivity*, Gordon & Breach

M. Wilson, *Superconducting Magnets*, Clarendon Press Oxford

Talk: M. Wilson, *Pulsed Superconducting Magnets*, Academic Training, CERN 2006

Biography

Doctor Antonio Pich:

Brief CV:

- Physicist, with degrees from London University.
- After an initial career in R&D on microwave tubes, he joined CERN in 1968 to work on the construction of the ISR.
- There followed a period of development and construction of magnet systems for the ISR machine and experiments.
- In LEP he was responsible for the low-beta insertions, which included superconducting quadrupoles.
- In addition to being responsible for the superconducting low-beta magnet systems for the LHC, he chaired the Magnet Advisory Group for the LHC detector magnets.
- He has lectured on particle accelerators and on magnets at Imperial College, London, and at CERN Accelerator Schools.