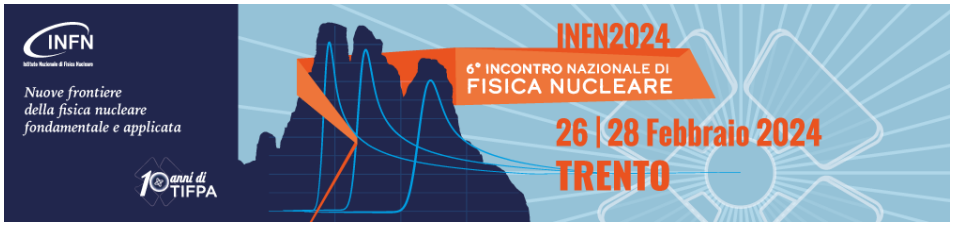

Contribution ID: **79** Type: **flash talk**

Bulk MgB2 superconductor for Nuclear Physics experiments

Tuesday, February 27, 2024 5:25 PM (5 minutes)

In my talk I will illustrate the studies carried out at INFN-Ferrara on a novel idea of using bulk MgB_2 superconductor as replacement of conventional superconducting magnets in particle physics experiments.
The advantages of this technology are many: possibility to use almost arbitrary shape/size; no need of current leads (reduced heat-load and size); no power consumption (beyond cooling) once stable conditions are reached; high magnetic field (with preset setup we easily reached ~1 T with limited material budget, few mm of MgB_2 only, since the copper quench shield is not required).
Furthermore it can be used both as a magnet (i.e. to generate/trap a magnetic field, for example to hold the polarization of a target) and also as a shield from strong external fields.
I will present the studies initiated on a first tube of MgB_2 (actually a scrap, with irregular shape) and continued with new samples produced with different "recipes" and dimensions.
The results are promising in both configurations: with an external dipole field of ~ 1T, a trapped field of ~0.9T or a shielding of 90% (thus measuring a penetrating field of only ~0.1T) could be obtained despite the unconventional geometry (tube).

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