

## **Ion traps for nuclear decay studies: the design for a handheld Electron Beam Ion Trap (EBIT)**

A. Musumarra<sup>1,2</sup>, C. Massimi<sup>2,3</sup>, M. G. Pellegriti<sup>2</sup>, F. Leone<sup>1,2</sup>

<sup>1</sup>University of Catania, Department of Physics and Astronomy  
Via Santa Sofia 64, I-95123 Catania, Italy.

<sup>2</sup>Istituto Nazionale di Fisica Nucleare (INFN)  
Via Enrico Fermi 54, 00044 Frascati (Rome) Italy.

<sup>3</sup>University of Bologna, Department of Physics and Astronomy I-40126 Bologna  
Via Irnerio 46, 40126 Bologna, Italy.

Nuclear decay studies in ionized species are of paramount importance in many astrophysical scenarios: from Big-Bang Nucleosynthesis [1] to cosmochronometers [2,3]. Recently, new facilities, able to investigate nuclear decay in hot plasma, have been conceived and their design is in progress [4]. Anyhow, the use of hot plasma in ECR traps intrinsically exhibits a limitation due the high level of background and, on the other side, the necessity to push at the limit the ECR technology to get large plasma density and temperature. Here we report about a different approach, involving the design of an ultra-compact Electron Beam Ion Trap ( $\mu$ -EBIT) able to perform nuclear decay studies for high charge-state ions confined in cold plasma. A preliminary design of the trap, assembly and magnetic field characterization will be shown, a comparison with other medium-small size EBIT installed worldwide will be performed [5,6].

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