Contribution ID: **93** Type: **Oral presentation**

Observation of independence of the nuclear de-channeling length on the particle charge sign

Tuesday, 27 September 2016 17:20 (15 minutes)

Under coherent interactions, particles undergo correlated collisions with
the crystal lattice and their motion result in confinement in the fields of atomic planes, i.e. particle channeling. Other than coherently interacting with the lattice, particles also suffer incoherent interactions with individual nuclei and may leave their bounded motion, i.e., they de-channel. This latter is the main limiting factor for applications of coherent interactions in crystal-assisted particle steering. We experimentally investigated the nature of dechanneling of 120 GeV/c e− and e+ in a bent silicon crystal at H4-SPS external line at CERN. We found out that while channeling efficiency differs significantly for e− (4±2%) and e+ (53±2%), their nuclear dechanneling length is comparable, (0.7±0.1) mm for e− and (0.85±0.15) mm for e+. The experimental proof of the equality of the nuclear dechanneling length for positrons and electrons is interpreted in terms of similar dynamics undergone by the channeled particles in the field of nuclei no matter of their charge.

Primary authors: BERRA, Alessandro (MIB); SYTOV, Alexei (FE); MAZZOLARI, Andrea (FE); DE SALVADOR, Davide (LNL); BAGLI, Enrico (FE); VALLAZZA, Erik Silvio (TS); GERMOGLI, Giacomo (FE); BANDIERA, LAURA (FE); PREST, Michela (MIB); GUIDI, Vincenzo (FE)

Presenter: GUIDI, Vincenzo (FE)

Session Classification: S1.4: Channeling & Radiations in Crystals