Contribution ID: **37** Type: **Poster**

Development of a novel muon beam line for next generation precision experiments

Tuesday 10 September 2013 18:00 (3 hours)

Several next generation precision measurements like muonium (Mu=μ^+e^-) spectroscopy, (g-2)$_\mu$, searches for Mu-$\overline{\text{Mu}}$ oscillations and muon (μ^+) electric dipole moment can be conceived with improved μ^+ and Mu beams.

The principle of the novel μ^+ beam line proposed in PRL \textbf{97}, 194801 (2006) is to stop a standard μ^+ beam in He gas at cryogenic temperatures, and to compress the μ^+ swarm using electric and magnetic fields and gradients of gas densities. Results of the longitudinal compression measured at πE1 beam line of PSI together with the proposed test of transverse compression will be presented.

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Session Classification: Poster, BBQ & Drinks