



Contribution ID: 42

Type: **not specified**

## Absolute mass measurement of oxygen-16 at THe-Trap

*Tuesday, 13 October 2015 13:00 (1h 30m)*

THe-Trap is a Penning-trap mass spectrometer that aims to measure the atomic mass ratio of tritium to helium-3 with a relative uncertainty of  $1 \cdot 10^{-11}$ . To test the experiment's accuracy and precision, we measured the mass ratio of carbon-12 to oxygen-16, which is one of the most precisely determined mass ratios [1].

In 2014 we reported a measurement of this mass ratio with a relative uncertainty of  $6.3 \cdot 10^{-11}$  [2], which was limited by systematic effects. Since then we upgraded the experiment, including the ion source, the vacuum system, and the amplifier for the detection of the induced image current. Due to the improved ion storage times we were able to characterize the amplitude dependent systematic shifts [3] and reach a significantly lower uncertainty that approaches the uncertainty of the literature value.

[1] R. S. Van Dyck Jr. et al., *Int. J. Mass Spectrom.* (2006) 251:231–242

[2] S. Streubel et al., *Appl. Phys. B* (2014) 114: 137–145

[3] J. Ketter et al., *Int. J. Mass Spectrom.* (2014) 358: 1–16

**Primary author:** SEGAL, Tom (Max-Planck-Institut für Kernphysik, Heidelberg, Germany)

**Presenter:** SEGAL, Tom (Max-Planck-Institut für Kernphysik, Heidelberg, Germany)

**Session Classification:** Poster Session