

# Control Code Development for Antiproton Transport

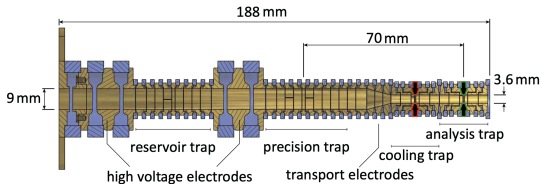
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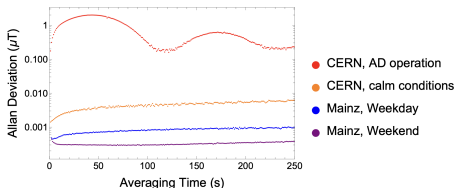
# The BASE Experiment

- The **Baryon-Antibaryon Symmetry Experiment** (BASE) performs high-precision measurements of the charge-to-mass ratio of protons and antiprotons as well as the antiproton g-factor to test CPT invariance.
- Antiprotons are loaded into a Penning trap in the Antiproton Decelerator (AD) hall where both their cyclotron and Larmor frequencies are measured to high precision.
- The BASE experiment's four trap setup has allowed for a measurement of the proton-to-antiproton charge-to-mass ratio with a precision of 16-parts-per-trillion.



# BASE-STEP

- Currently, the high level of magnetic noise in the AD hall is the bottleneck for increasing measurement precision.



- **BASE-STEP** (Symmetry Tests in Experiments with Portable antiprotons) is developing a portable antiproton trap to solve the problem.
- Antiprotons will be loaded into the trap in the AD hall and driven to an off-site laboratory with less magnetic noise.



# My Project

- I will be responsible for developing the control code for the BASE-STEP experiment under the guidance of **Dr. Christian Smorra**.
  - Interfacing with instruments, writing measurement scripts, etc.
- Currently I am working on tools to help with particle identification within the trap.
  - Parametric resonance sweep.
  - Trap electrode tuning.







Figure: Hiking in the Jura mountains.



Figure: Visiting Bern.