

## Decay Rate of Metastable 2S Atoms

- 2S atoms have same magnetic moment as 1S atoms and remain trapped after excitation
- The decay rate is measured by quenching with different wait times in a series of laser pulses
- Data collected for different temperatures and densities including degenerate regime
- Lifetimes of  $> 100$  ms have been observed; corresponds to  $< 30$  mV/cm stray electric fields

A long lifetime for metastables facilitates precision spectroscopy of transitions from the 2S to higher-lying states in hydrogen.

**Physics: the decay rate may be increased by**

- 1S-2S dipolar decay
- 2S-2S collisions
- Stray electric fields
- RF evaporation of 2S atoms