DETECTING LIGHT IONS AND ELECTRONS WITH TRIMS SILICON DETECTORS

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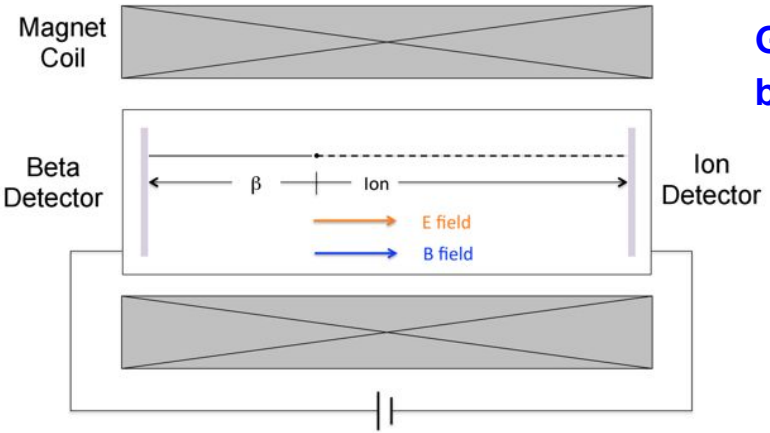
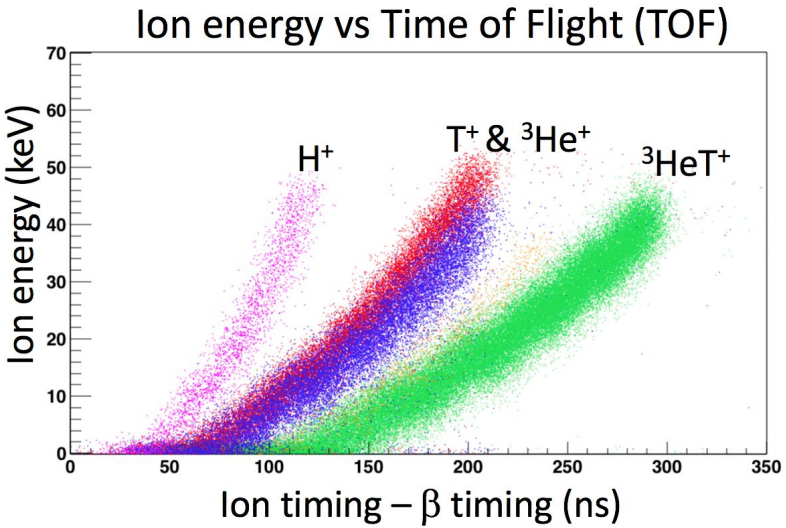


Goal: measure the molecular tritium (T_2) beta decay branching ratio to the bound state $^3HeT^+$.

- Understand the TRIMS energy reconstruction and branching ratios by modeling scattering interactions of ions and beta electrons inside the dead layer.

PIPS Canberra silicon detector

- ❏ Thickness: 500 μm
- ❏ Dead layer: 100 nm



Energy deposition of ions and betas in the silicon detectors

- Simulations with SRIM and KESS of ion and beta interactions in the dead layer

- Ion species-dependent interactions include:
  - Backscattering
  - Stopping
  - Energy deposited in dead layer

- Energy deposition of beta electrons
  - Electrons in energy range from 5 keV to 80 keV
  - Mean value for energy loss at each energy step