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Transport, Trapping and Extraction of Radioactive Heavy Ions in Superfluid Helium

Discussion Contribution

Transport, Trapping and Extraction of Radioactive Heavy Ions in Superfluid Helium

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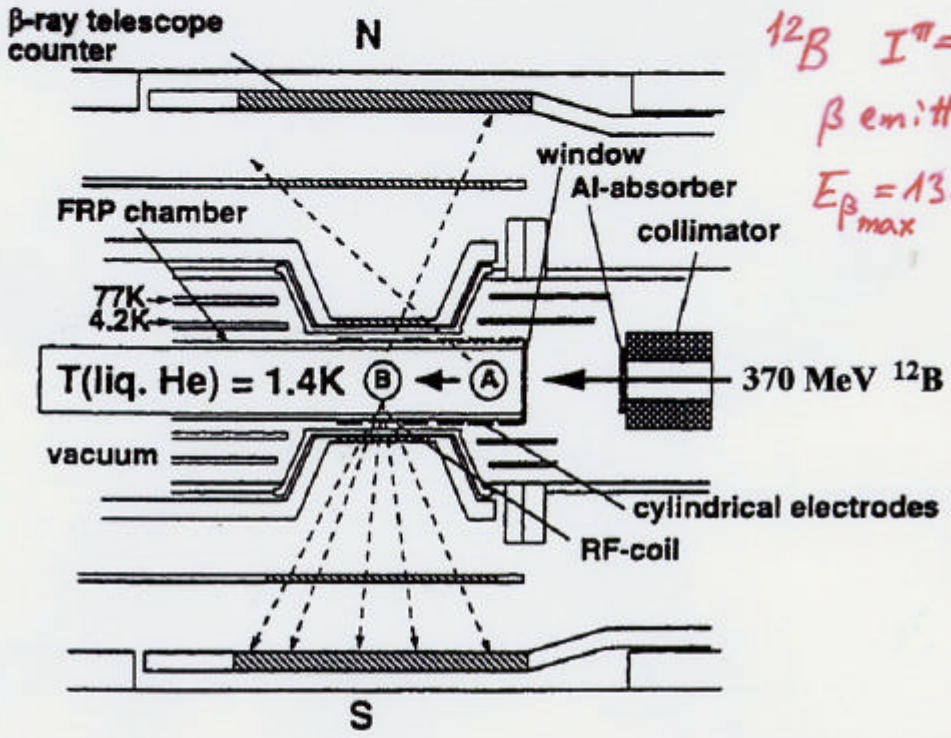
Proposals for for Stopping and Trapping of Radioactive Heavy Ions in Superfluid Helium and for Production of Low-Energy High Resolution RI Beams Based on Experiments at Osaka and Jyväskylä

Previous Radioactive Snowball Experiments

N. Takahashi *et al.*, Osaka



^{12}B $I^{\pi}=1^{+}$
β emitter
$E_{\beta\,max}$ = 13.7 M

- **Stopping high-energy ion beam**
- **Formation of snowballs** — ^{12}B, ^{8}Li etc.
- **Transport of snowball**

Snowball formation probability	**20%**
Snowball survival time	**~ 1 s**

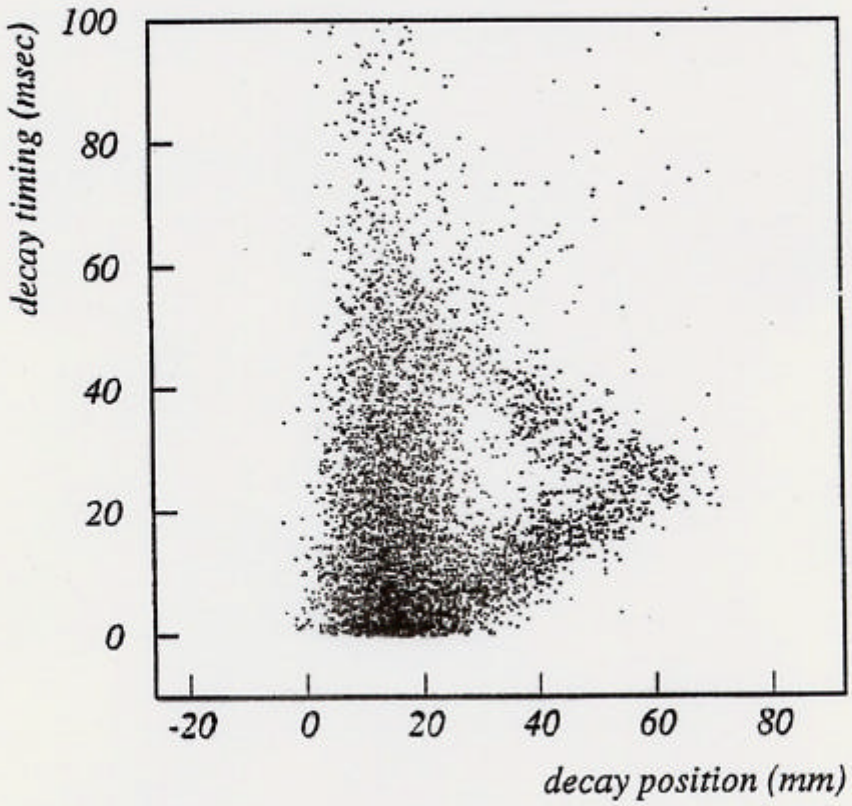
Position - Time Spectrum for ^{12}B ions in Superfluid Helium

^{12}B beta-radioactive

$T_{1/2} = 20.4$ ms $\quad I^{\pi} = 1^{+}$

Positively-charged

Neutrals Snowballs



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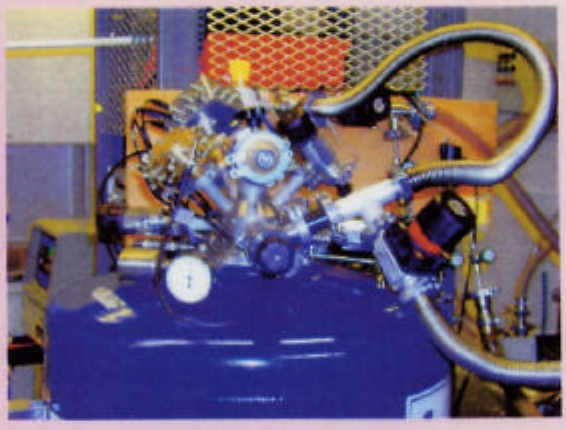
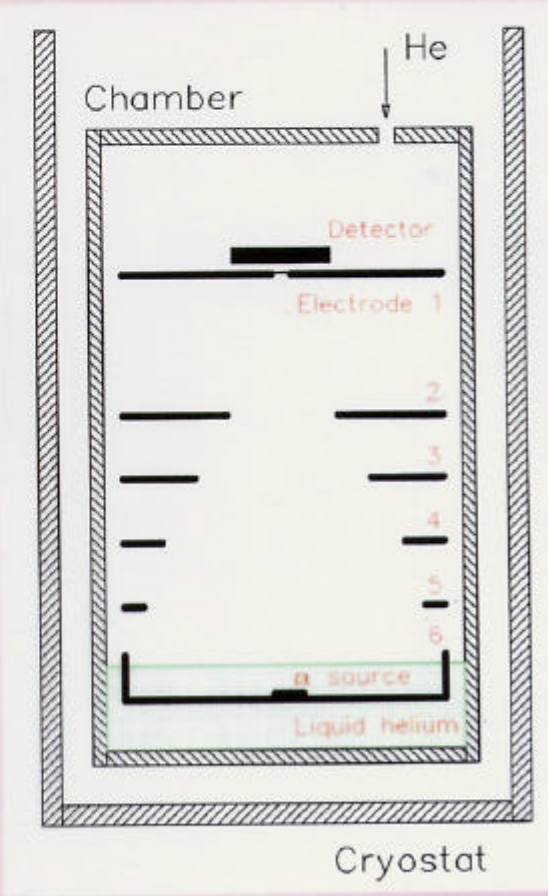
Setup description

- a cryostat
- a chamber containing the liquid helium
- a ^{223}Ra alpha-recoil source
- a set of ring electrodes to provide electric field to guide the snowballs/ions from the source onto a thin Al foil in front of the detector
- a surface-barrier detector to detect the alphas





JYFL