Exotic decay modes studied by means of the Warsaw Optical Time Projection Chamber

Chiara Mazzocchi

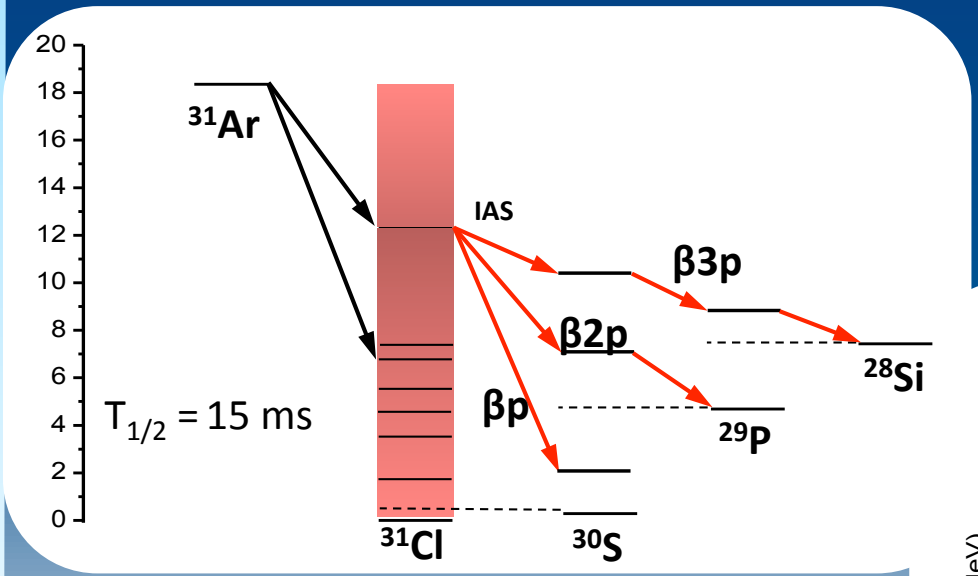
for the OTPC collaboration

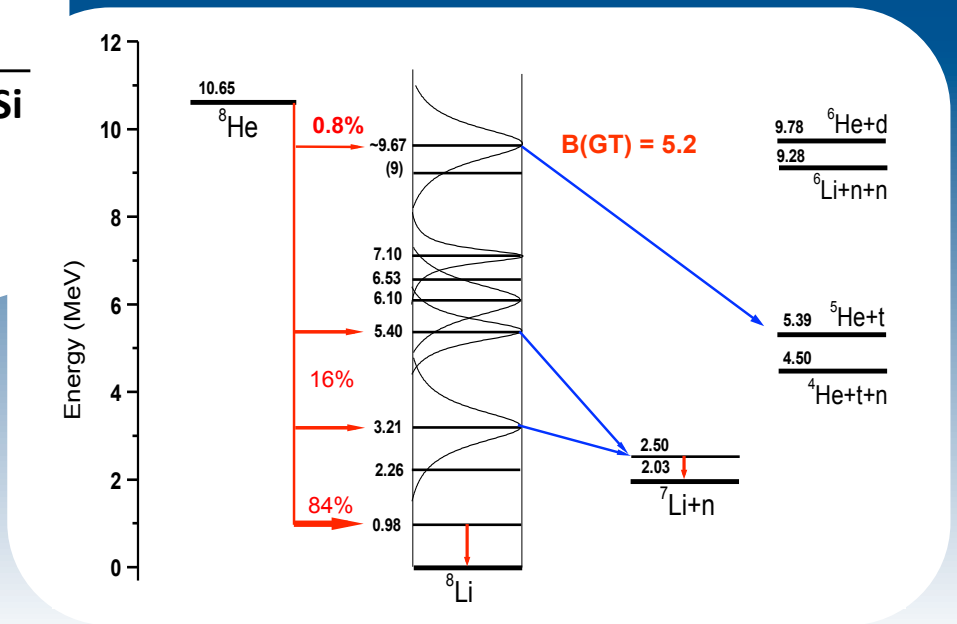
Faculty of Physics, University of Warsaw, Poland

Physics motivations

Radioactivity at the nuclear drip-lines

- exotic decay modes (1p, 2p radioactivity)
- β-delayed (multi-) particle emission



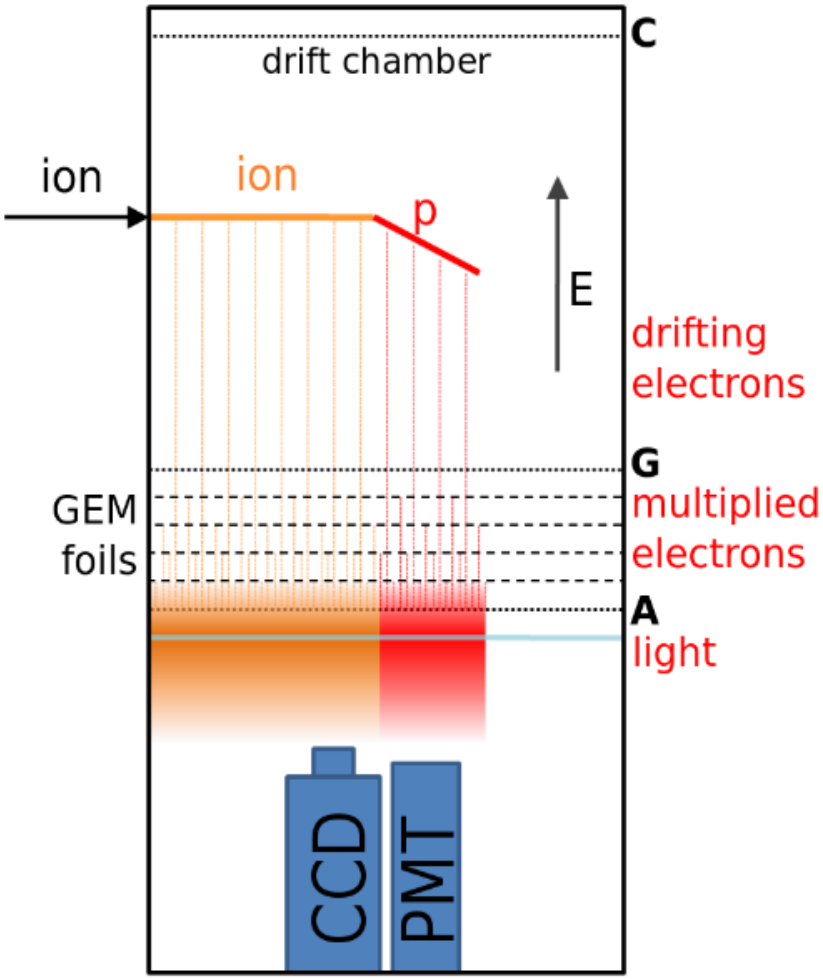


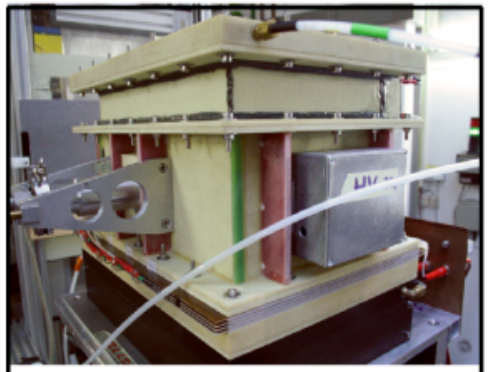
Experimental challenges

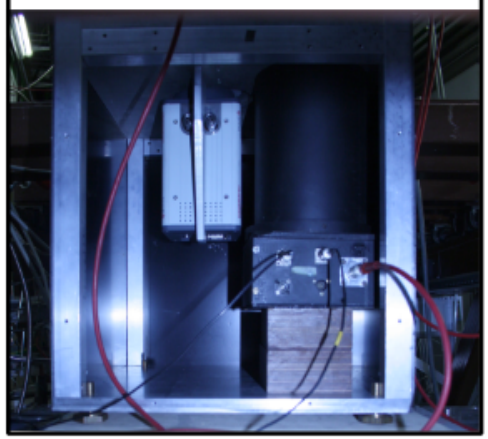
- Low production rates
- Small branching ratios
- High background levels
- Need for low-energy particle detection
- Need for particle correlation measurements

- Production of the isotopes of interest by projectile fragmentation
- In-flight separation (A1900@NSCL, FRS@GSI, ACCULINA@Dubna)
- Implantation of the separated fragments into the **O**ptical **T**ime **P**rojection **C**hamber (OTPC)

Optical Time Projection Chamber





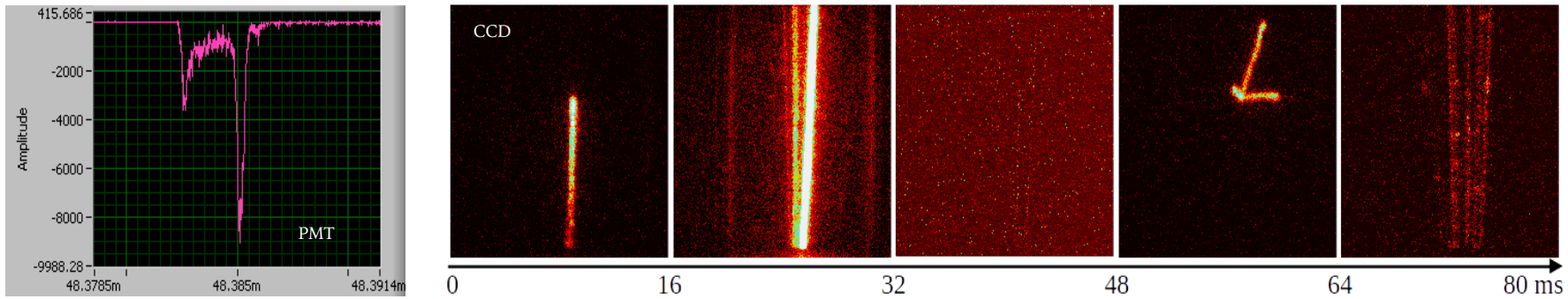


Results: a sampler

β-delayed three proton emission from ^{31}Ar

- multiple CCD exposure mode (5x 16 ms)
- 21000 implanted ^{31}Ar
- 13 β3p events

⇒ b(β3p)=0.06(2) %



A. Lis et al., Phys. Rev. C91(2015) 064309

Results

For details and more results

POSTER S2-17