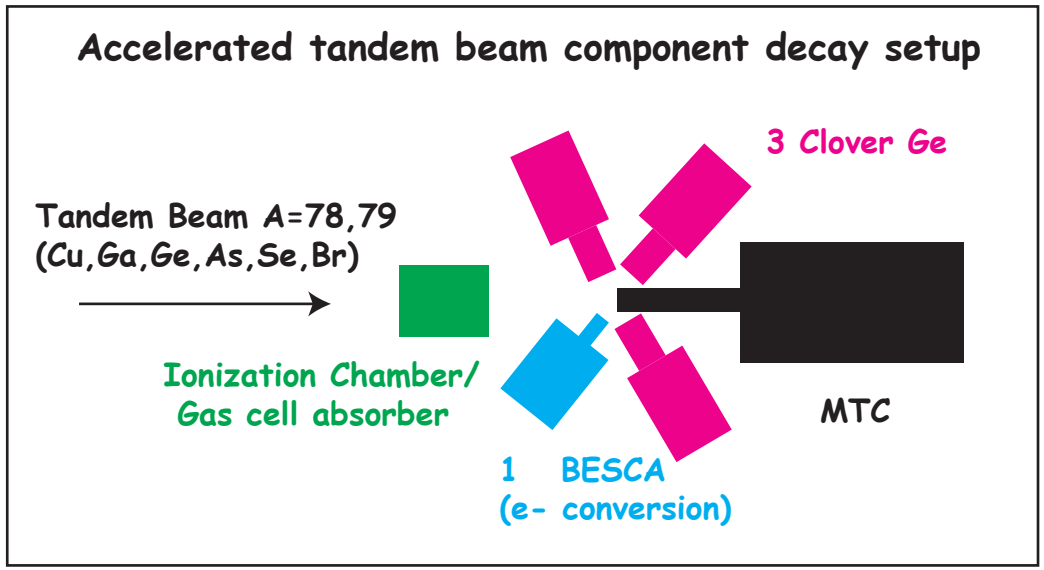
Decay studies using post-accelerated beam components



Higher Z components filtered out with gas stopper
Use of gas ensures uniformity and is easily adjustable
Longer-lived components discriminated against due to short halflives
Energy straggling seems reasonable according to STRIM
Angular straggling quite large but managable - 2 cm diameter beam spots 10 cm from gas
Gas stopper may act as an ionization chamber for component monitoring and beam position stability
Tandem energy of 3 MeV/u should be sufficient for Z identification (excepting tails)
These energies are easily achievable with single stripping
Shielding issues and ions stopping in mylar windows

First case: Cu isotopes since nearest neighbor Zn isotopes are not transported through the tandem
(they do not make negative ions)

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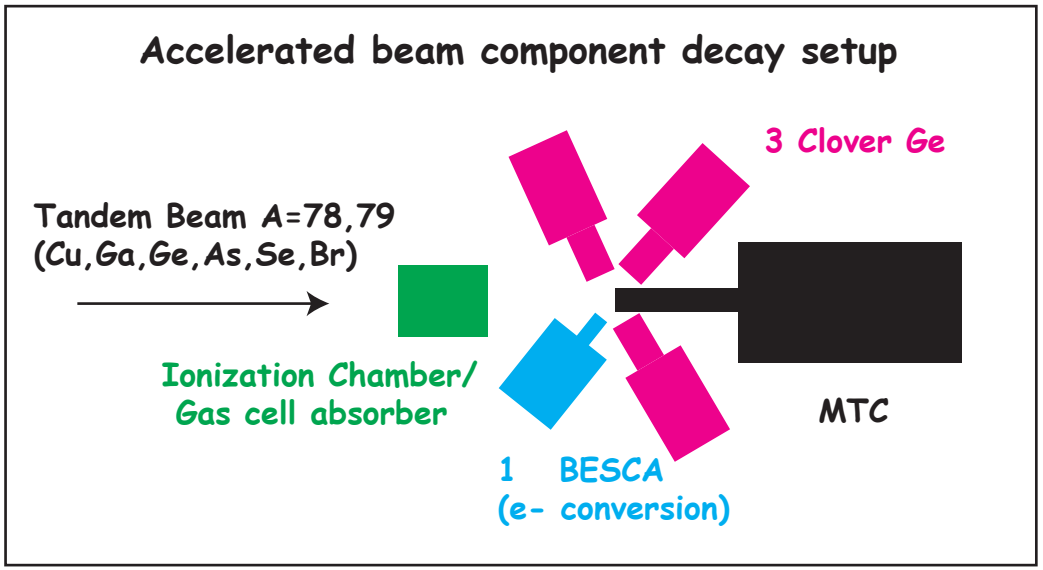
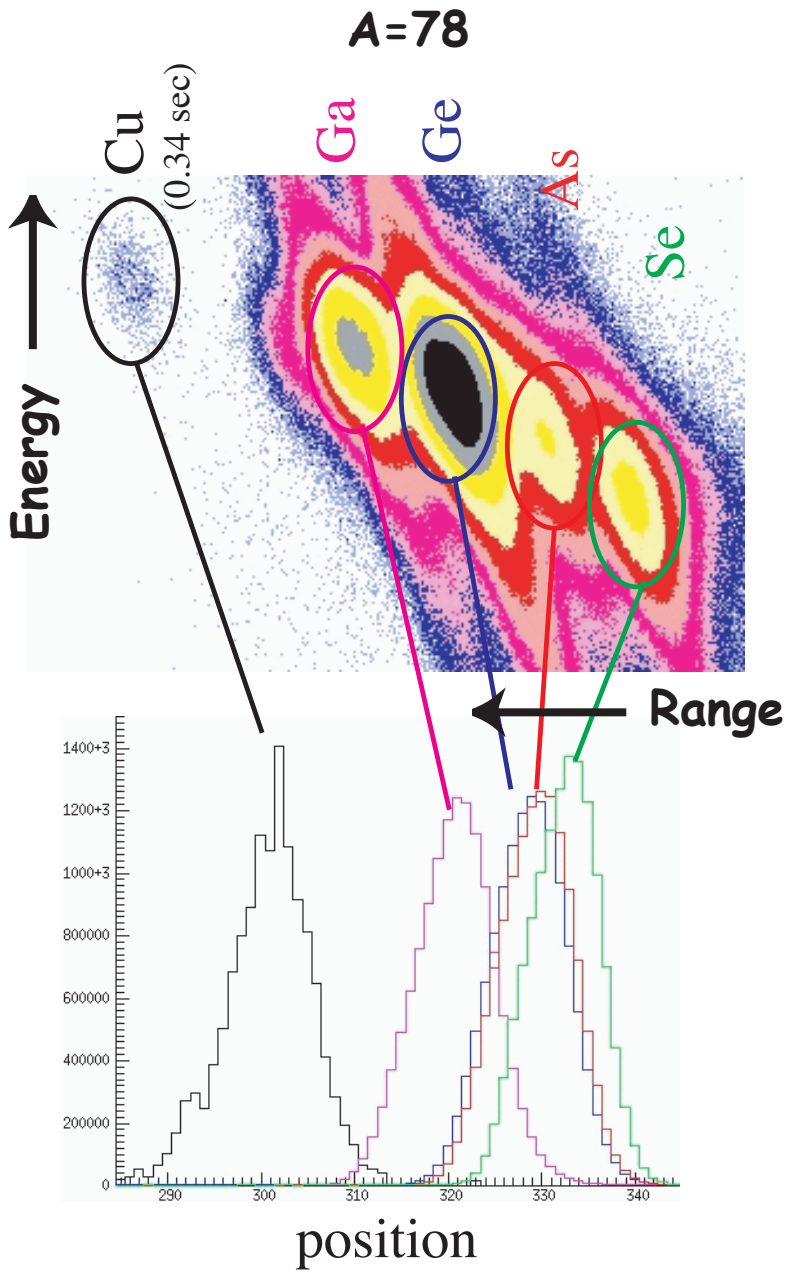
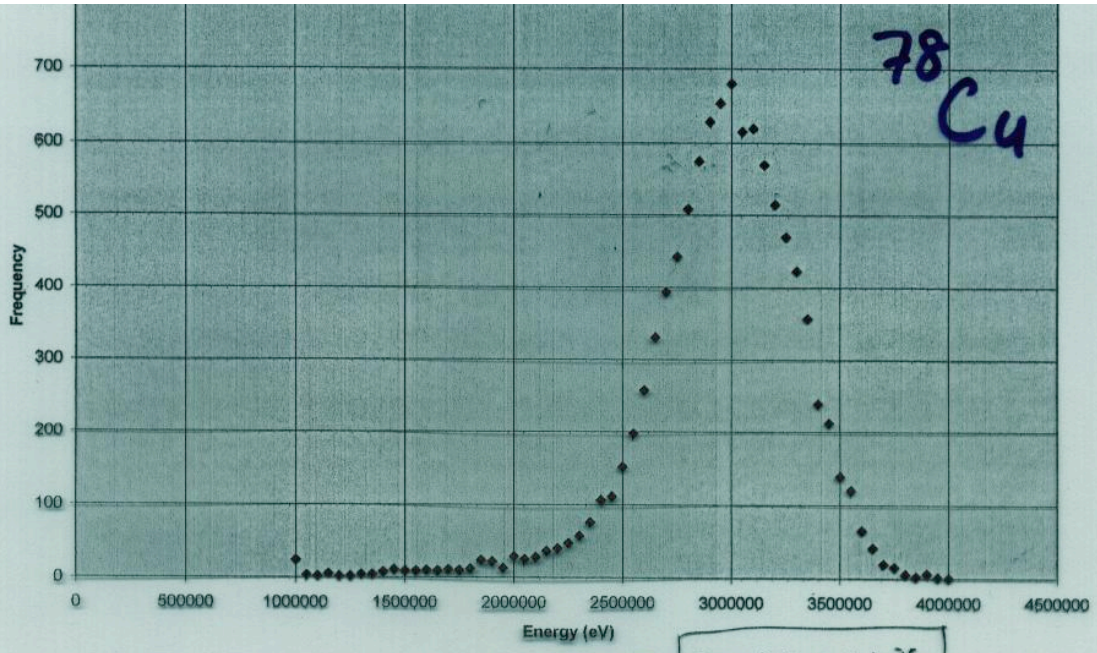




Halflives for various isotopes

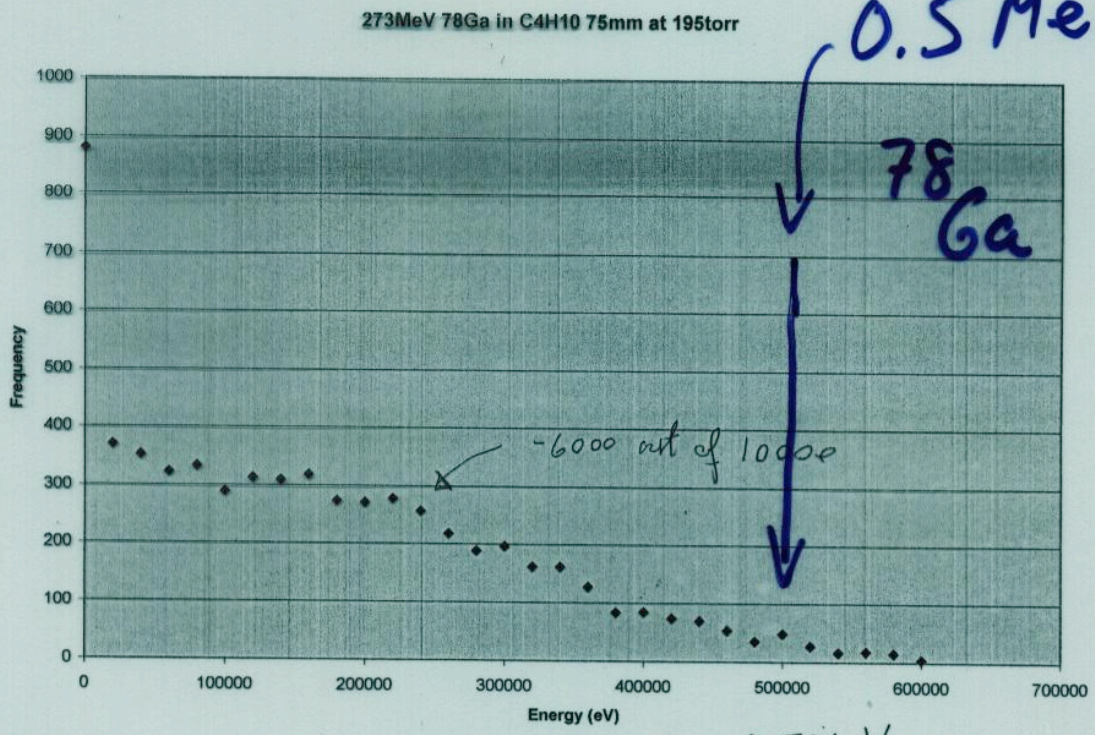
	79	78	77	76
Cu	0.2 s	0.3 s	0.5 s	0.6 s, 1.3 s
Zn				
Ga	2.9 s	5.5 s	13 s	33 s
Ge	39 s,19 s	88 m	53 s, 11 h	Stable

Cu-Ga distance at tandem slits: ~1 mm
Tandem voltage stabilityon scale of minutes
Difference in energy detected from energy losses in MCP and Bragg detector foils



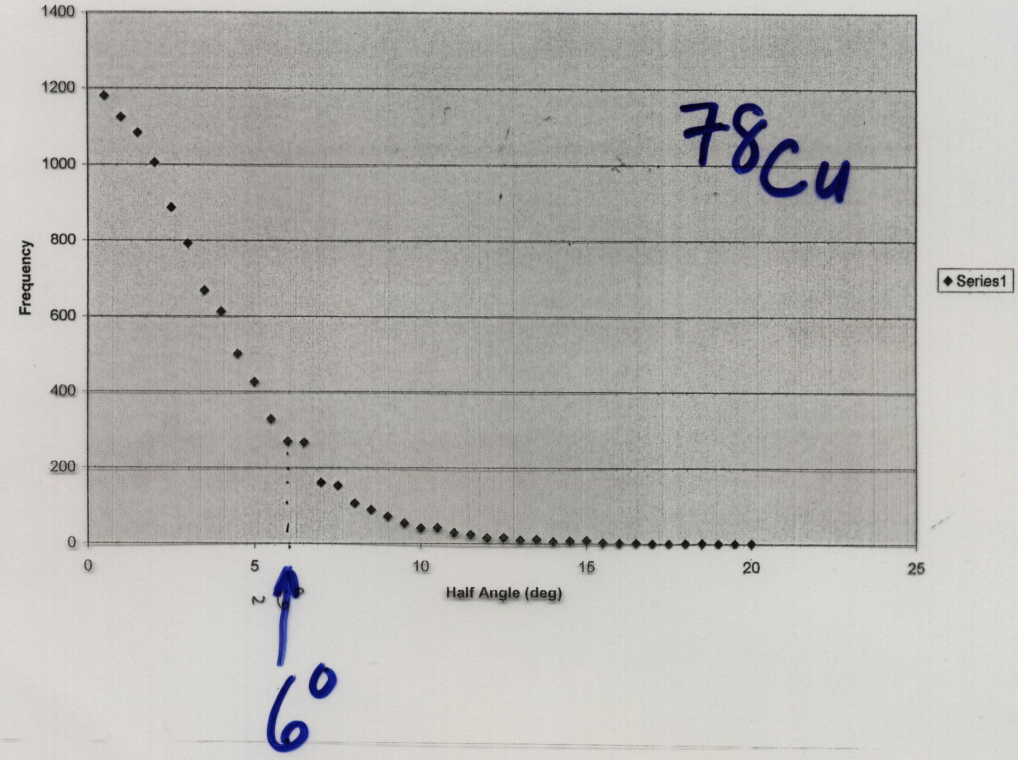
3MeV ± 0.6MeV

3 ± 0.6 MeV

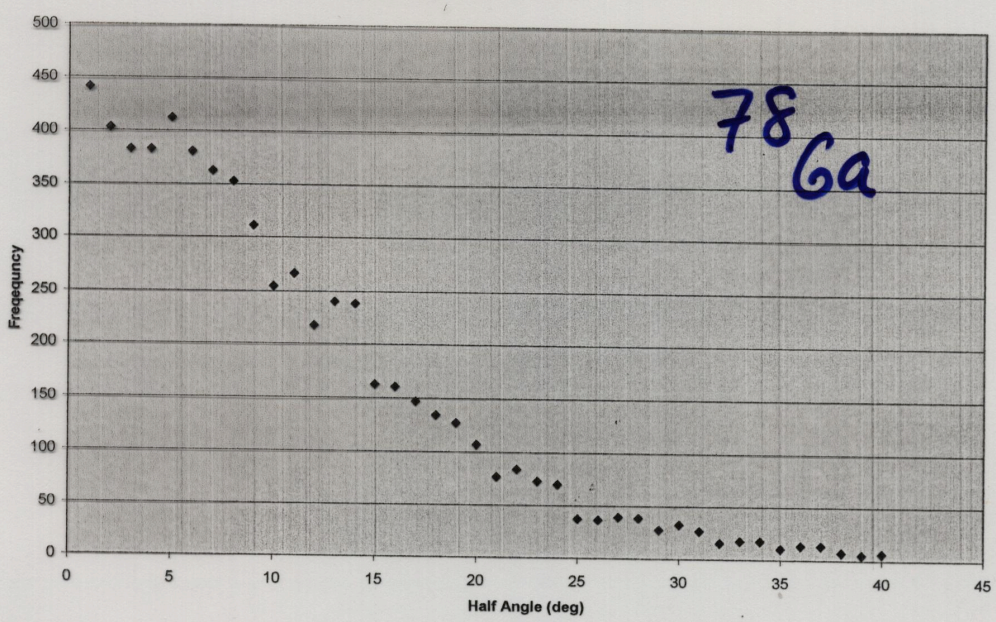


0.5MeV

273MeV 78Cu in 75mm of C4H10 at 195Torr



273MeV 78Ga in C4H10 75mm at 195torr



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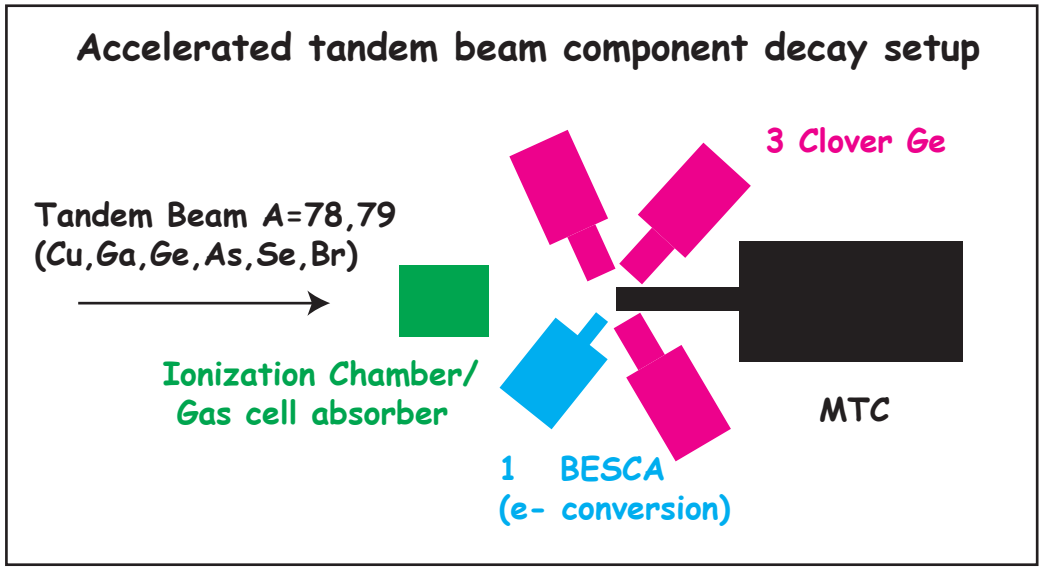

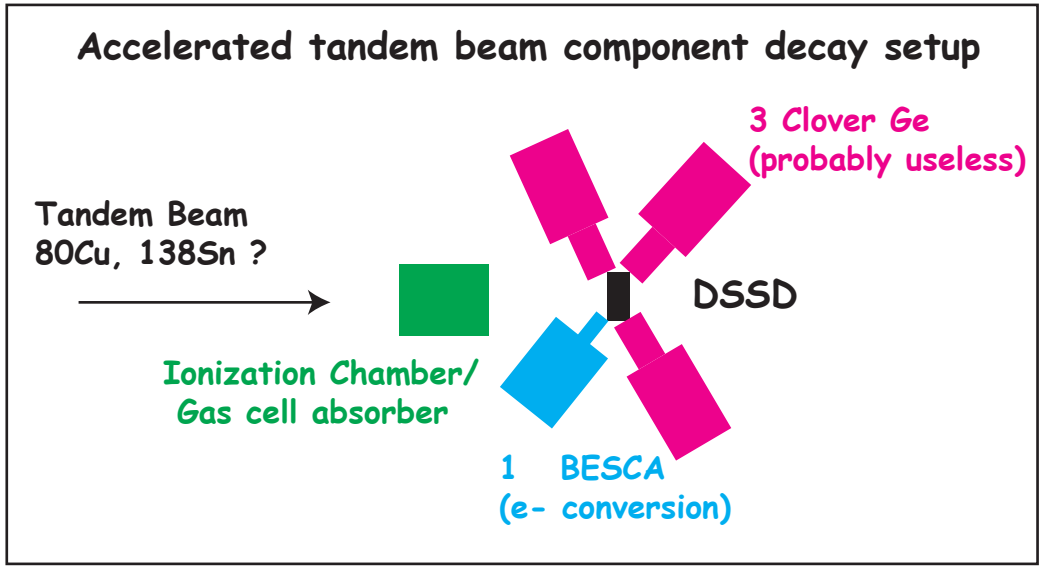

Can we reduce rates so far to make possible the use of thick DSSDs and measure beta halflives really far from stability ?