

Electrons in Deuteron Fusion

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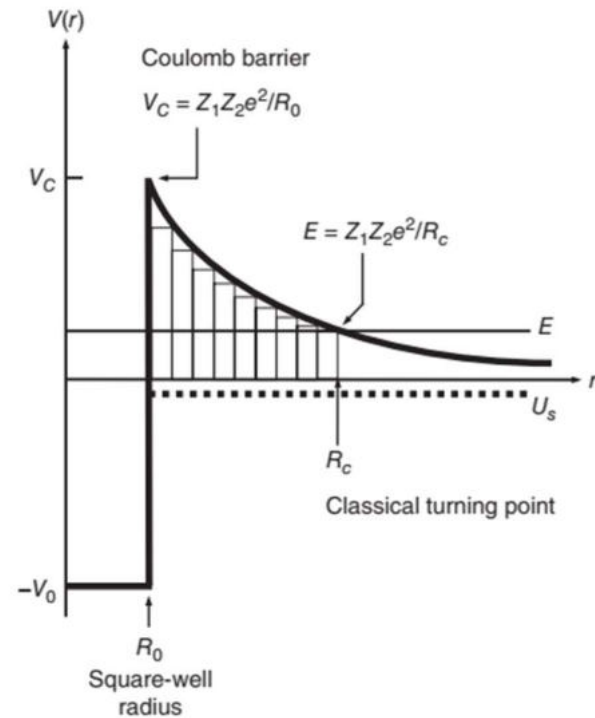
Russbach, March 2024

Low Energy Nuclear Reactions



Ion gun

Electron detector



Transmission through the Coulomb barrier

Ion gun



Deuterium implanted into graphite, zirconium or titanium at 3.5 kV resulting in up to 200 at. % deuterium concentration.

D_3^+ : 86%

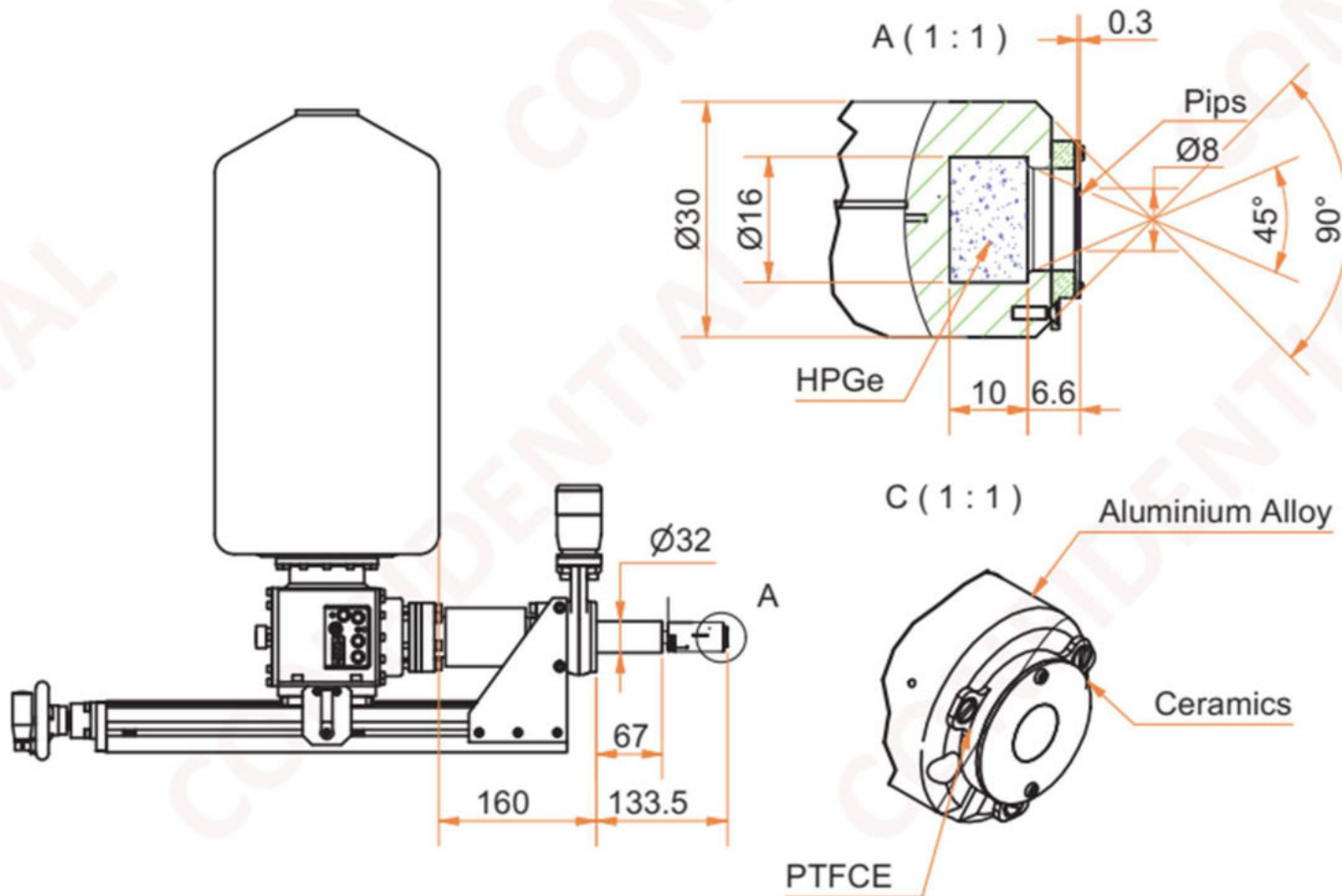
D_2^+ : 12%

D^+ : 2%

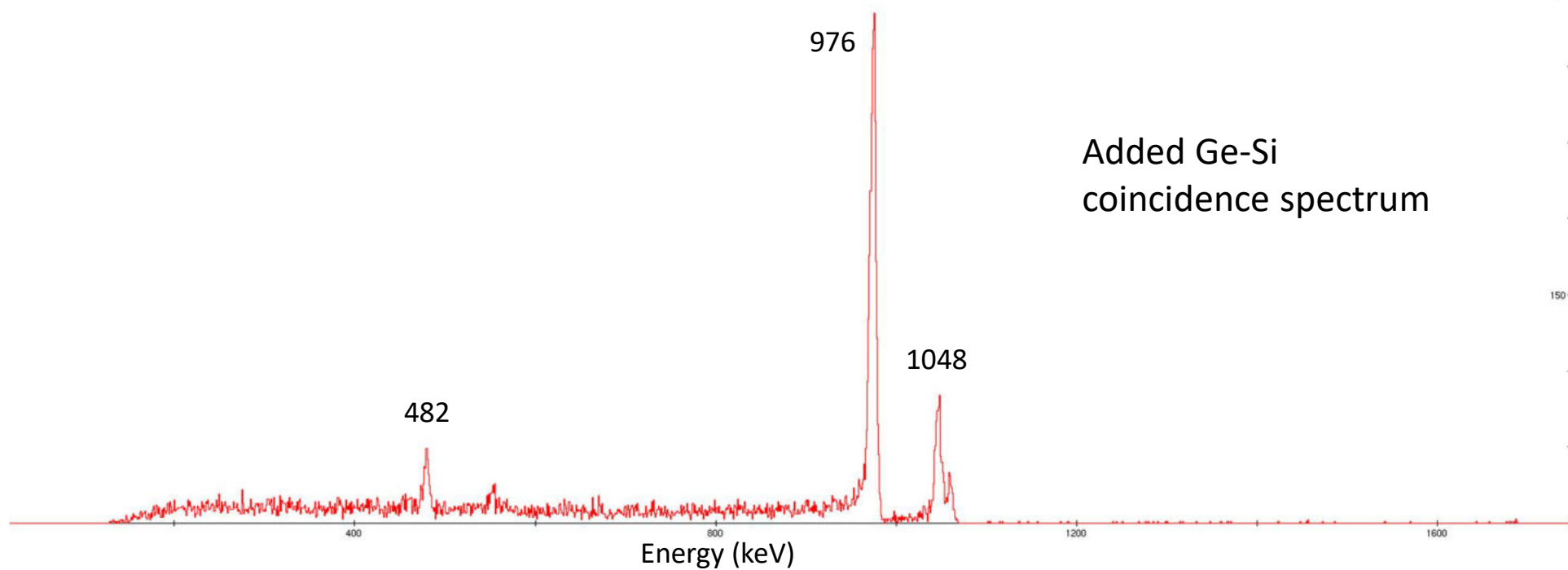
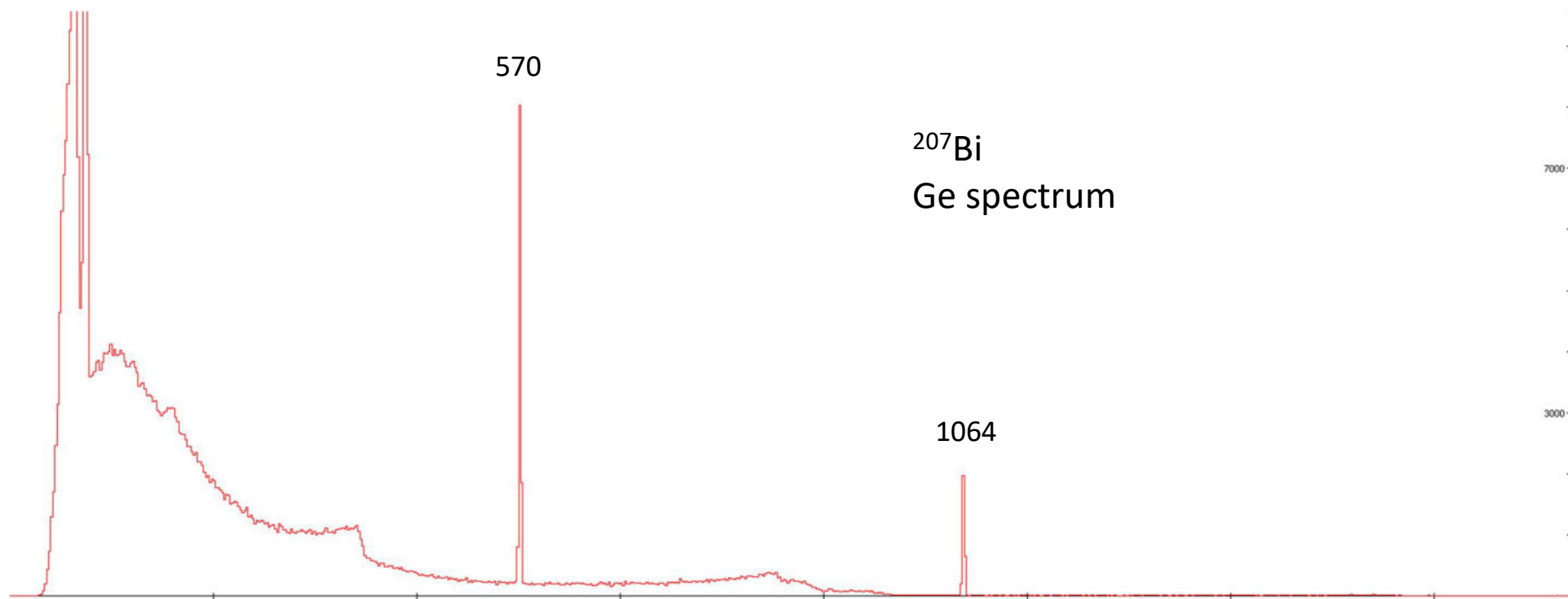
$\langle E \rangle = 1.3$ keV

S. Markelj et al., Nucl. Fusion **59** (2019) 086050.

Electron detector



$$\eta = (7.5 \pm 0.2) 10^{-5}$$



Threshold resonance in ^4He ???

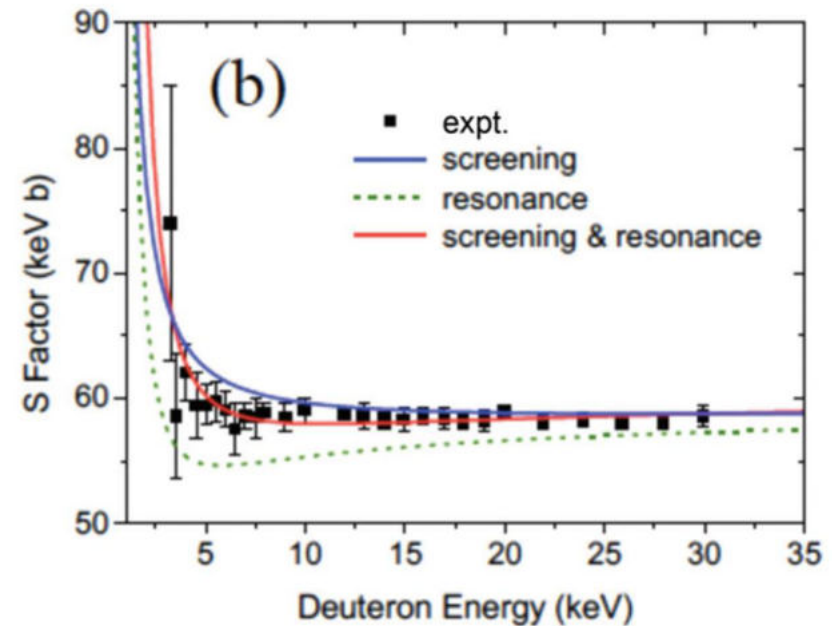
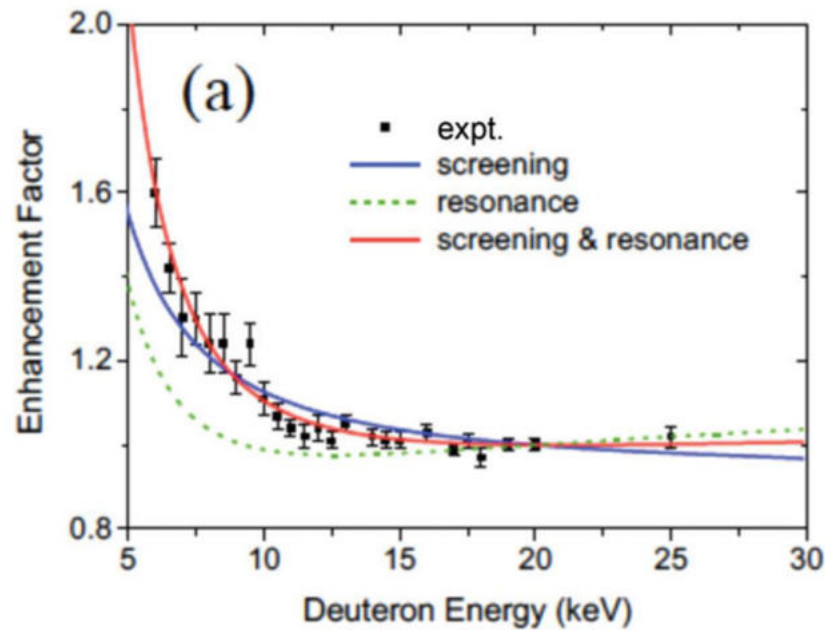
PHYSICAL REVIEW C **106**, L011601 (2022)

Letter

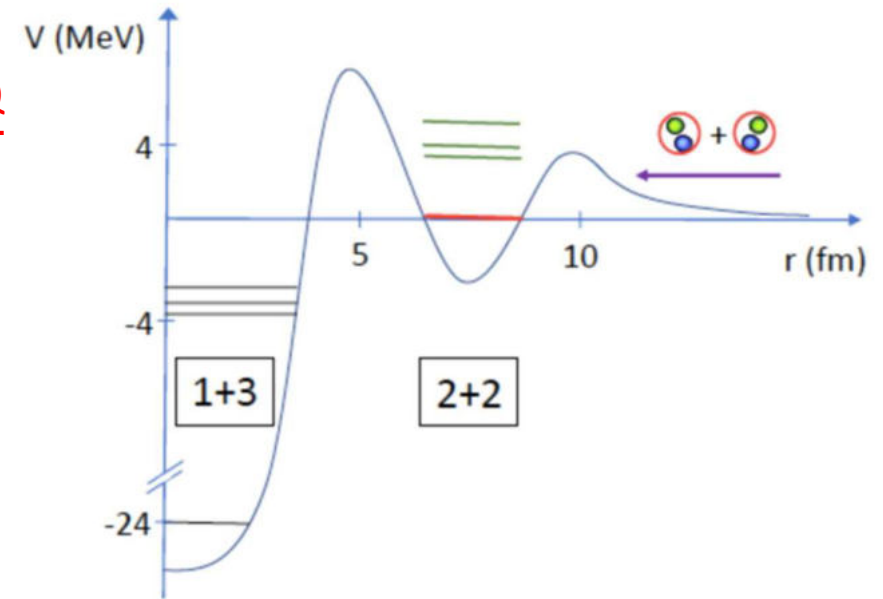
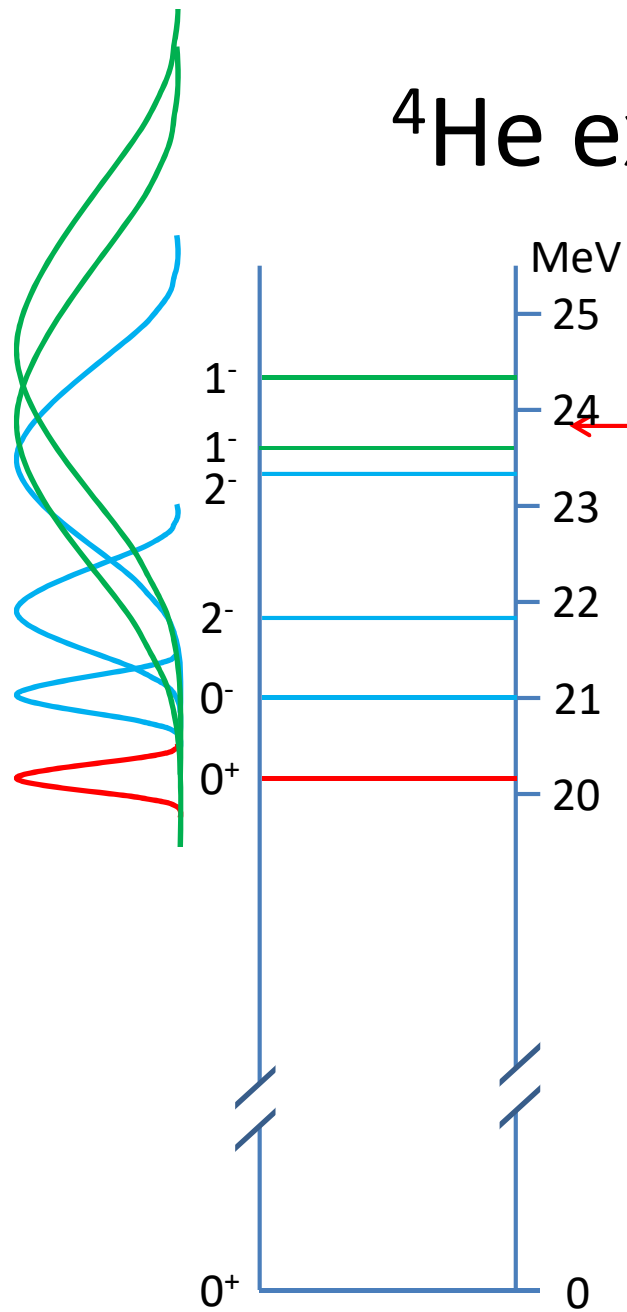
Deuteron-deuteron nuclear reactions at extremely low energies

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^4He excitation



branching		
$d+d \rightarrow$	$p+t$	0.5
	$n+^3\text{He}$	0.5
	$^4\text{He} + \gamma$	10^{-7}

Conclusions

???

Go to work!