The decay of ^{31}Ar

arXiv:1404.2143

Sizeable beta-strength in 31Ar(beta-3p) decay

Submitted to PLB

arXiv:1402.4620

Multi-particle emission in the decay of 31Ar

Submitted to PRC

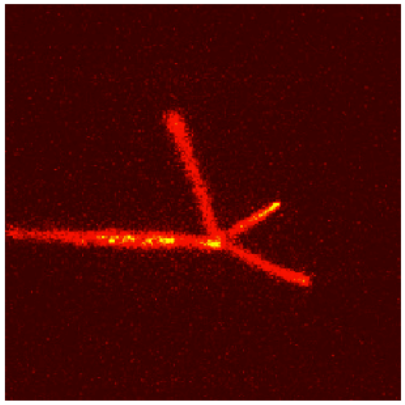
Magisol Workshop

April 27, 2014

β3p-decay

Spin determinatio

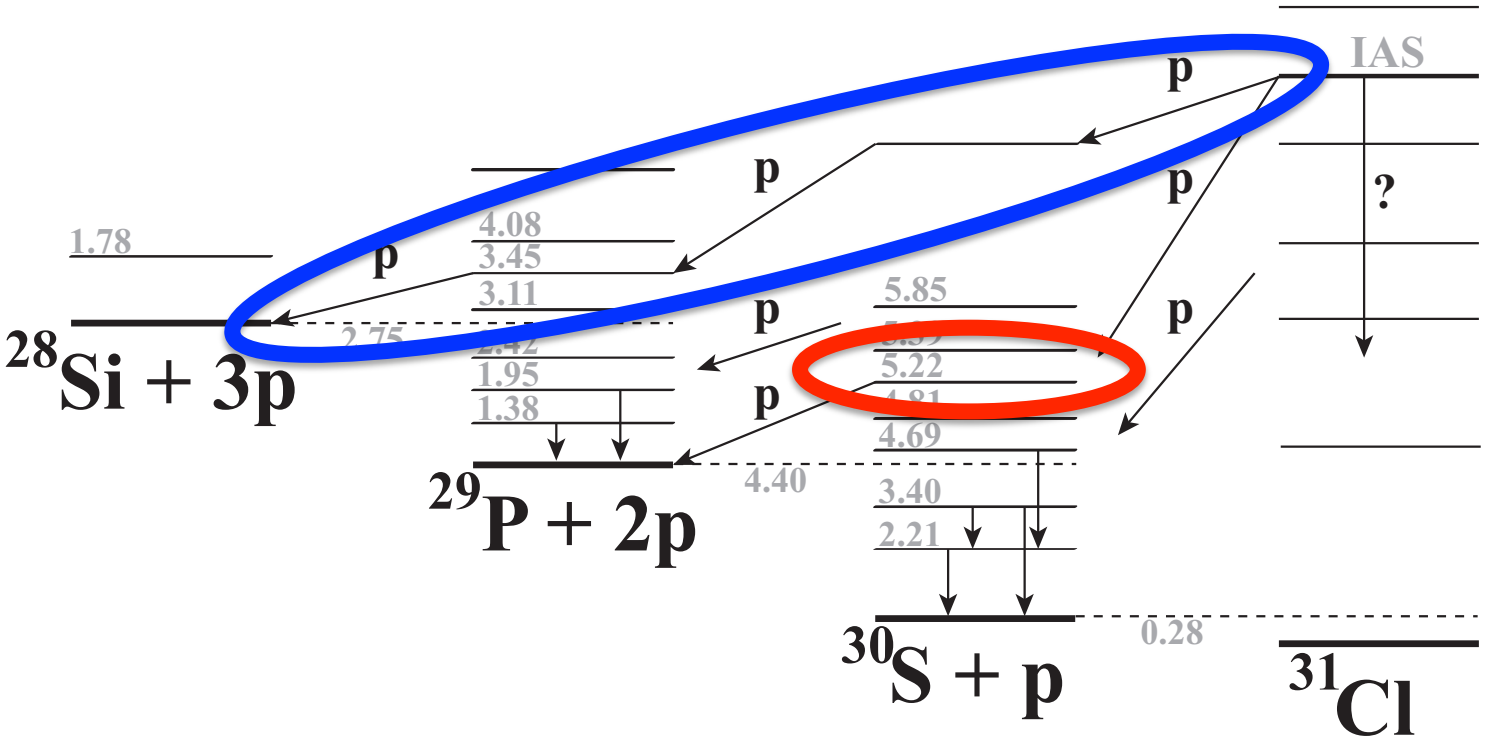
5.22 MeV level in ?



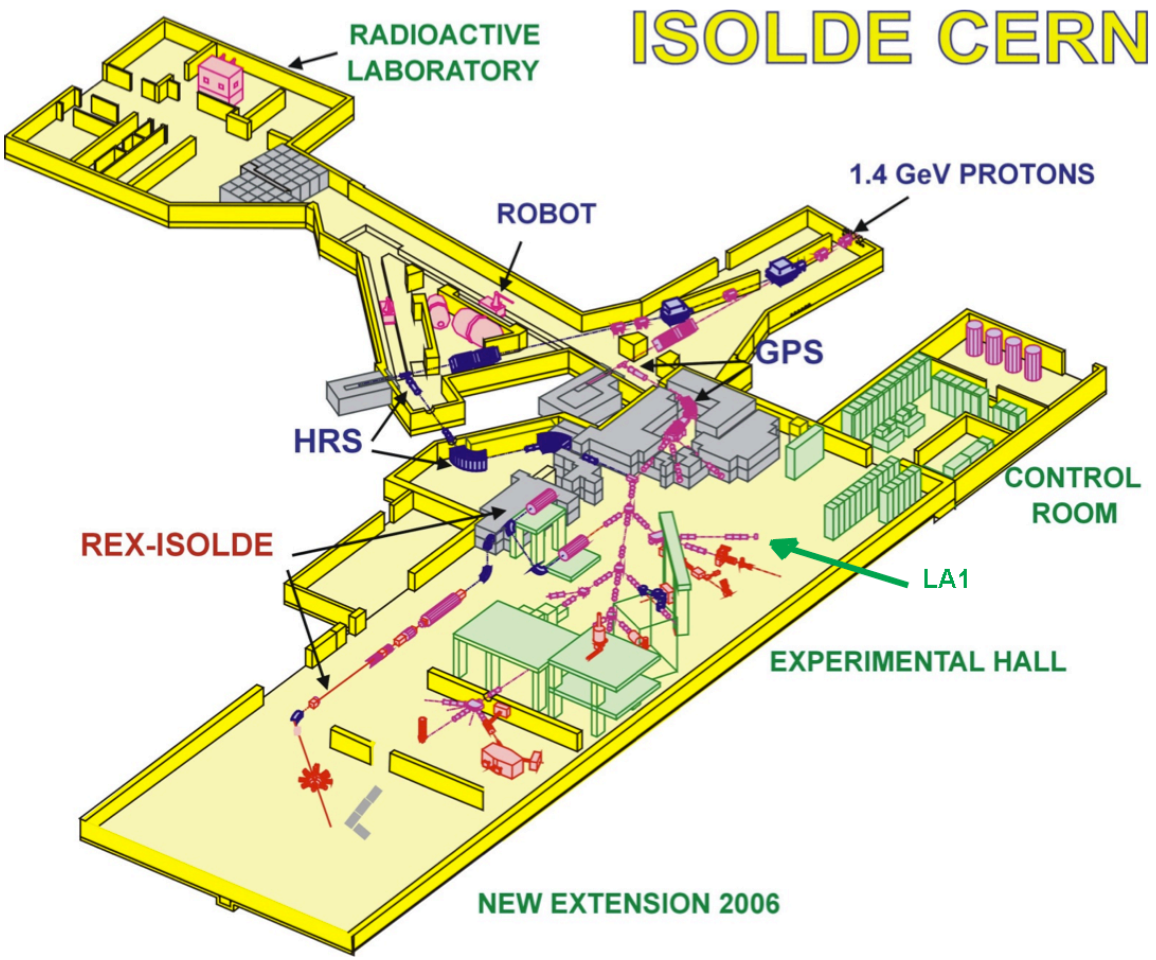
M. Pfützner *et al.* (2012)

$$J^{\pi} = \frac{5}{2}^{+}$$

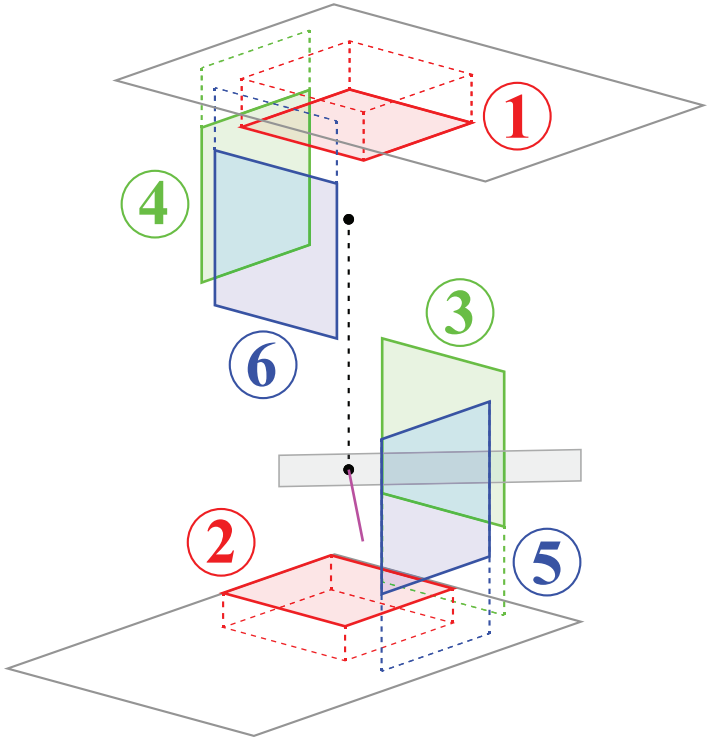
$$T_{\frac{1}{2}} = 15.1(3)\text{ms}$$

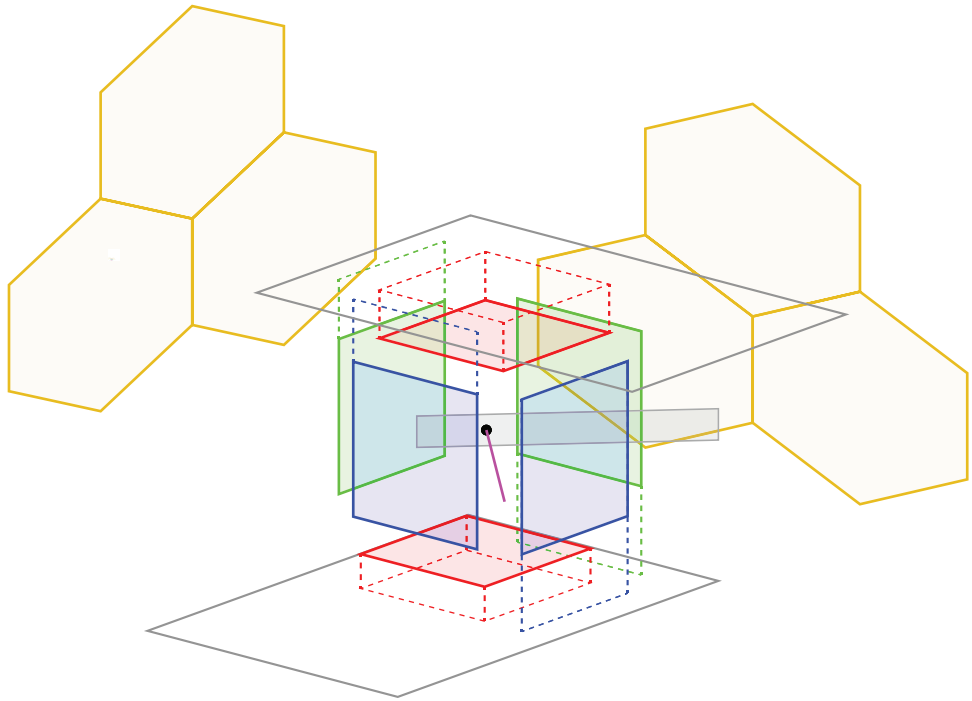


ISOLDE

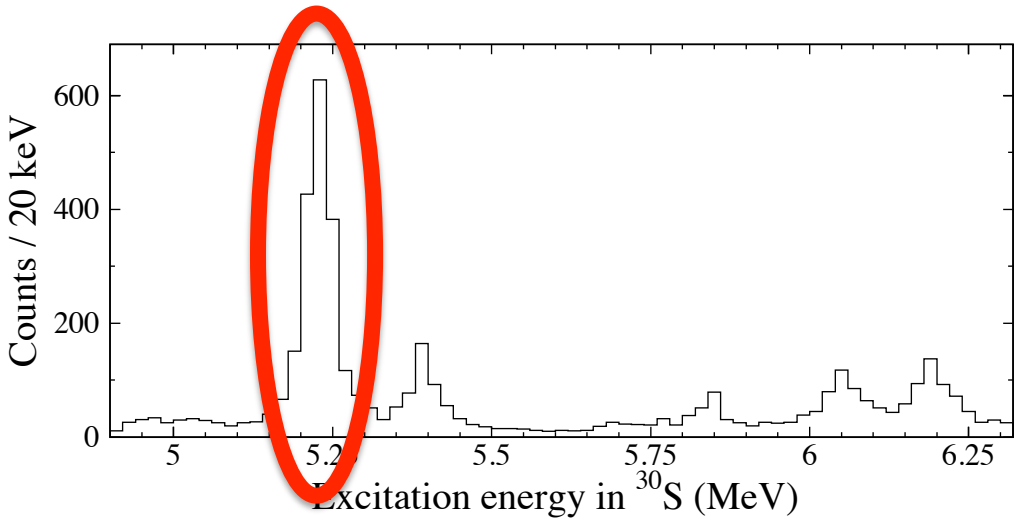

ISOLDE CERN
RADIOACTIVE LABORATORY
1.4 GeV PROTONS
ROBOT
GPS
HRS
CONTROL ROOM
REX-ISOLDE
LA1
EXPERIMENTAL HALL
NEW EXTENSION 2006

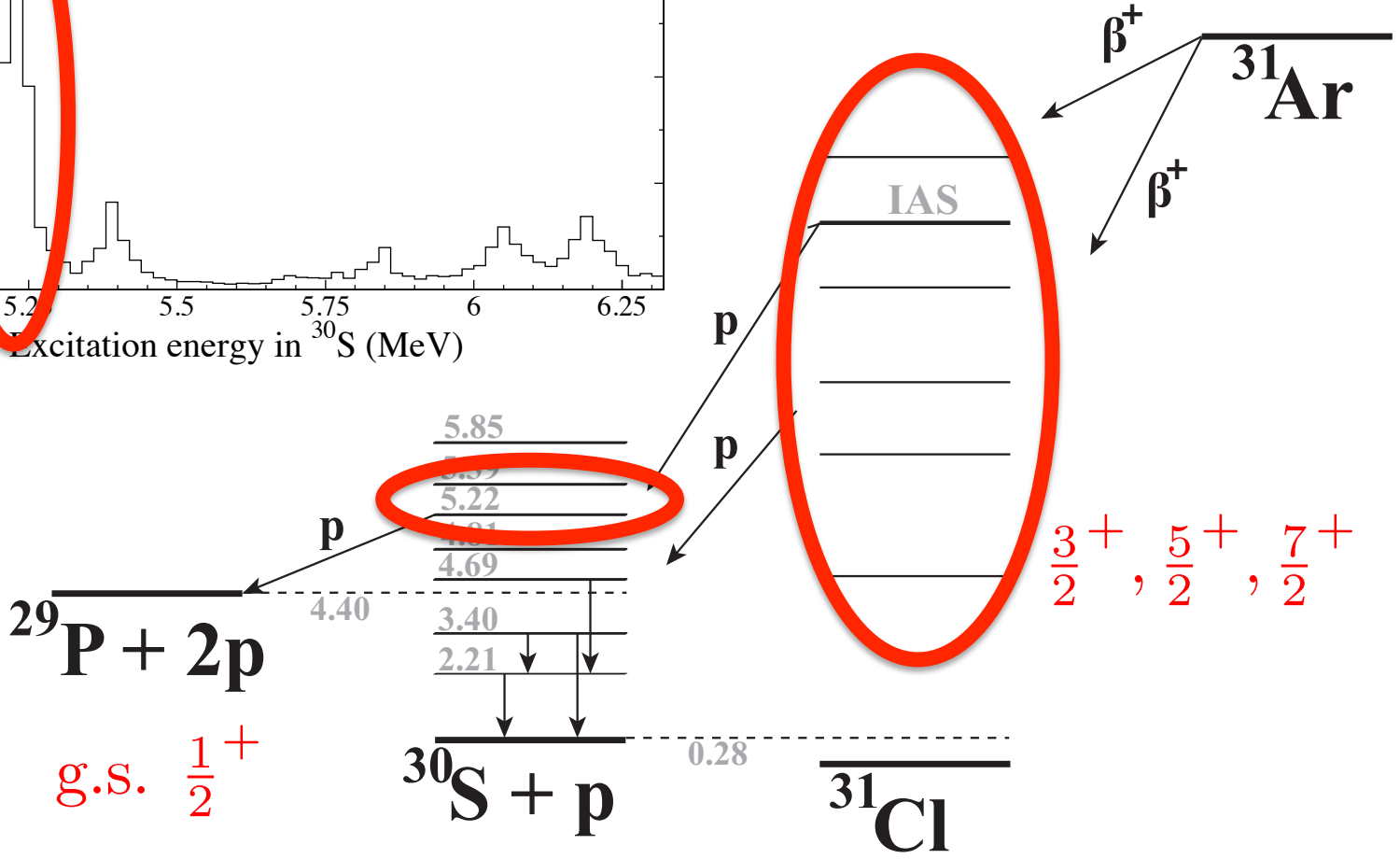
Setup



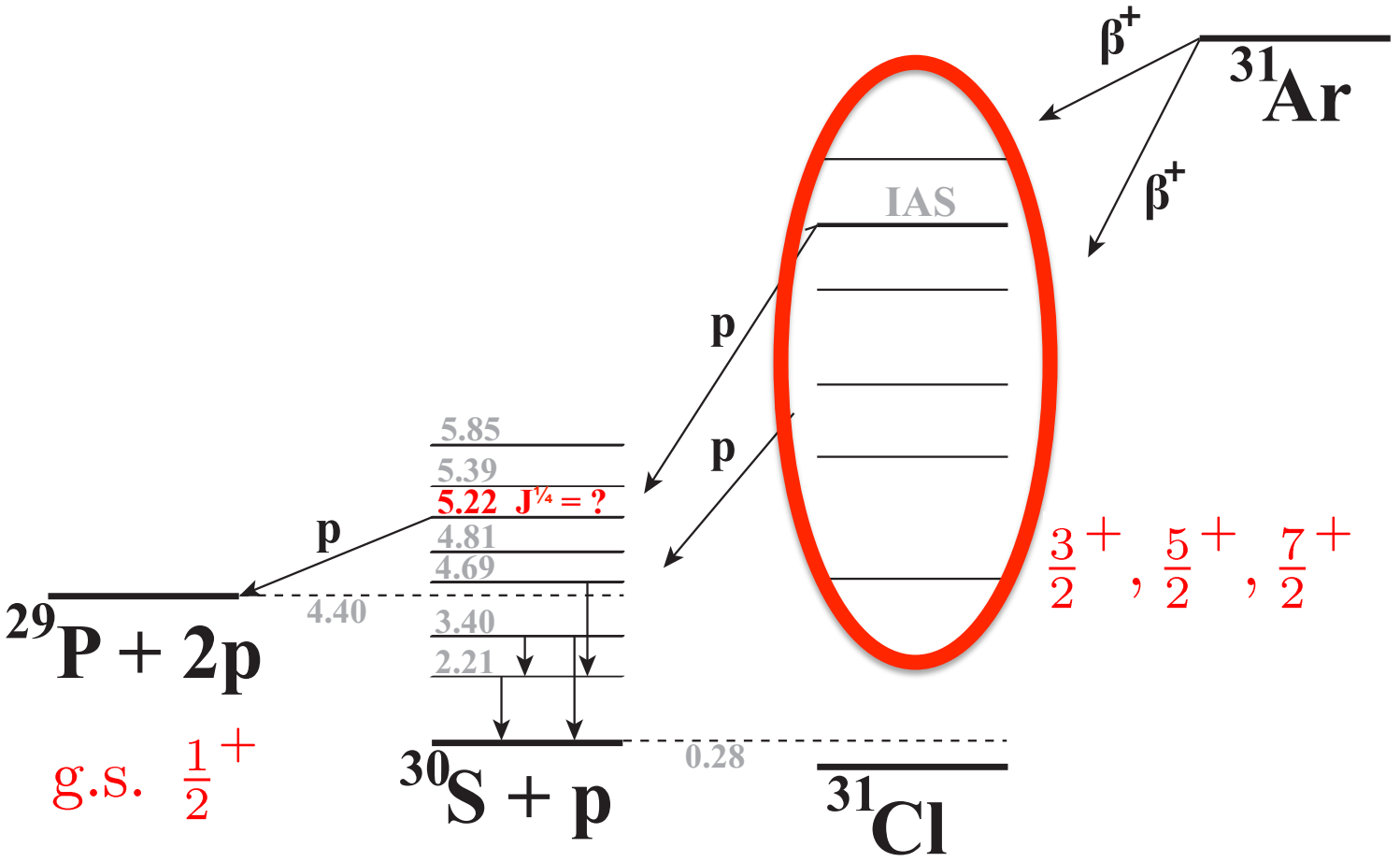


Spin determination of levels in ^{30}S

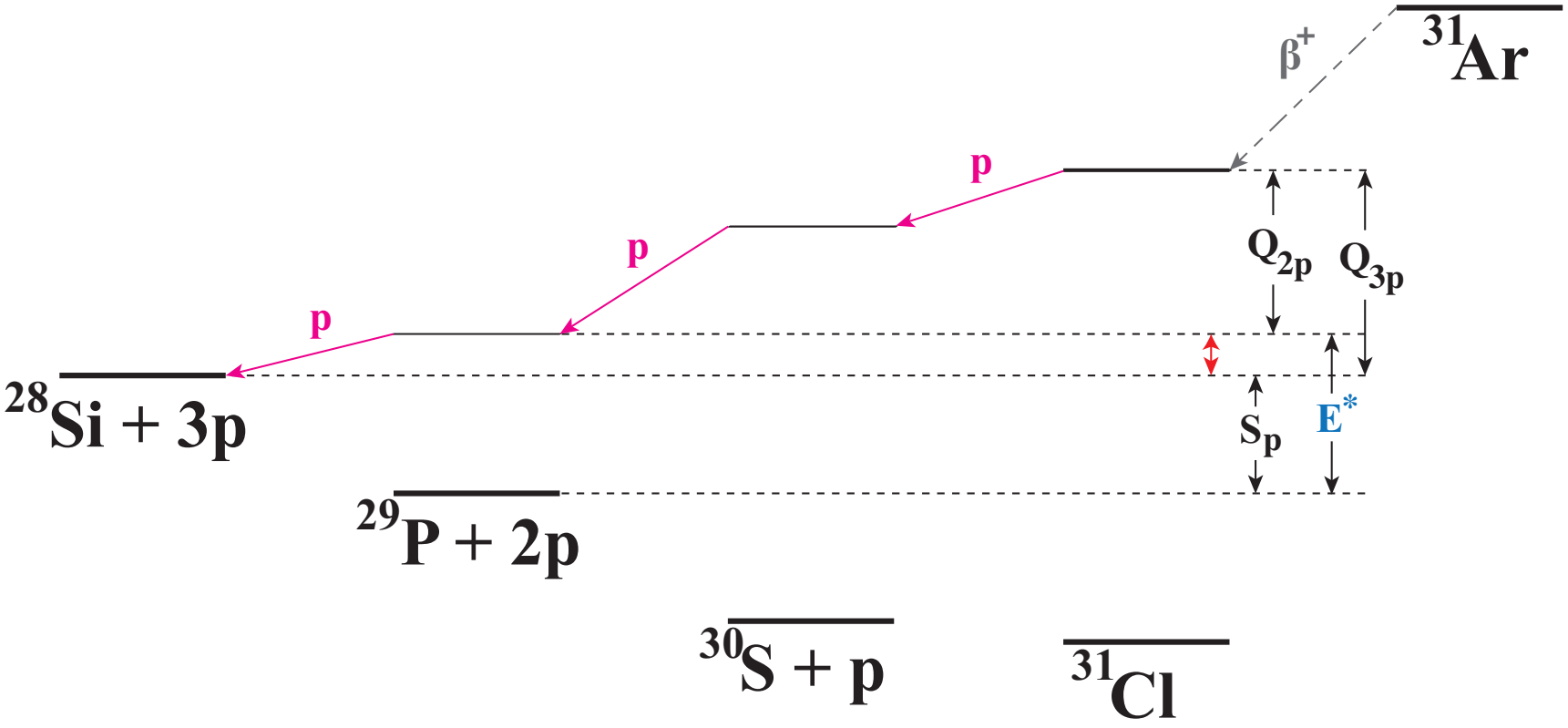




Spin determination of the 5.22 MeV level in ^{30}S

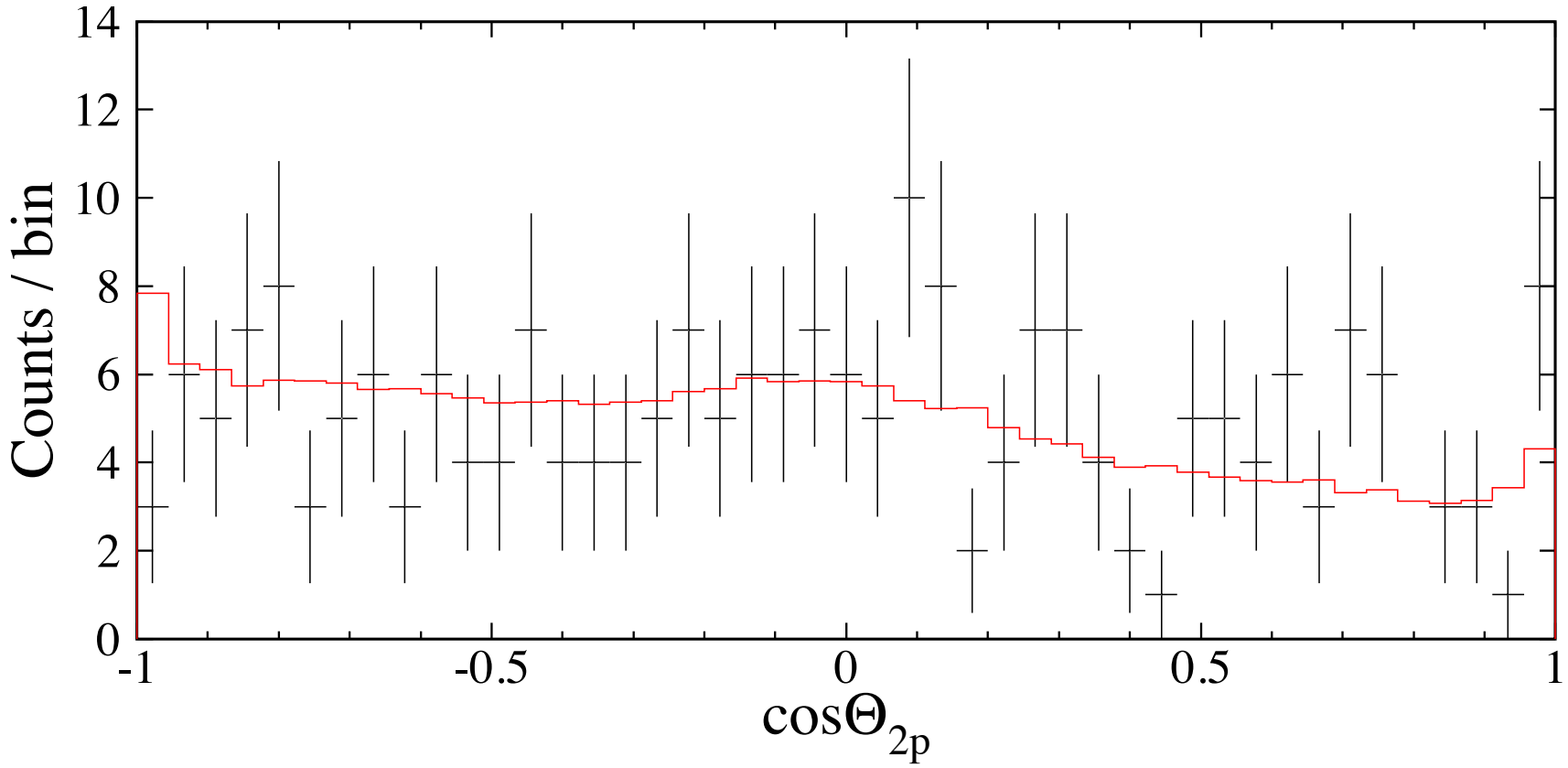


β3p-decay



Spin determination of the 5.22 MeV level in ^{30}S

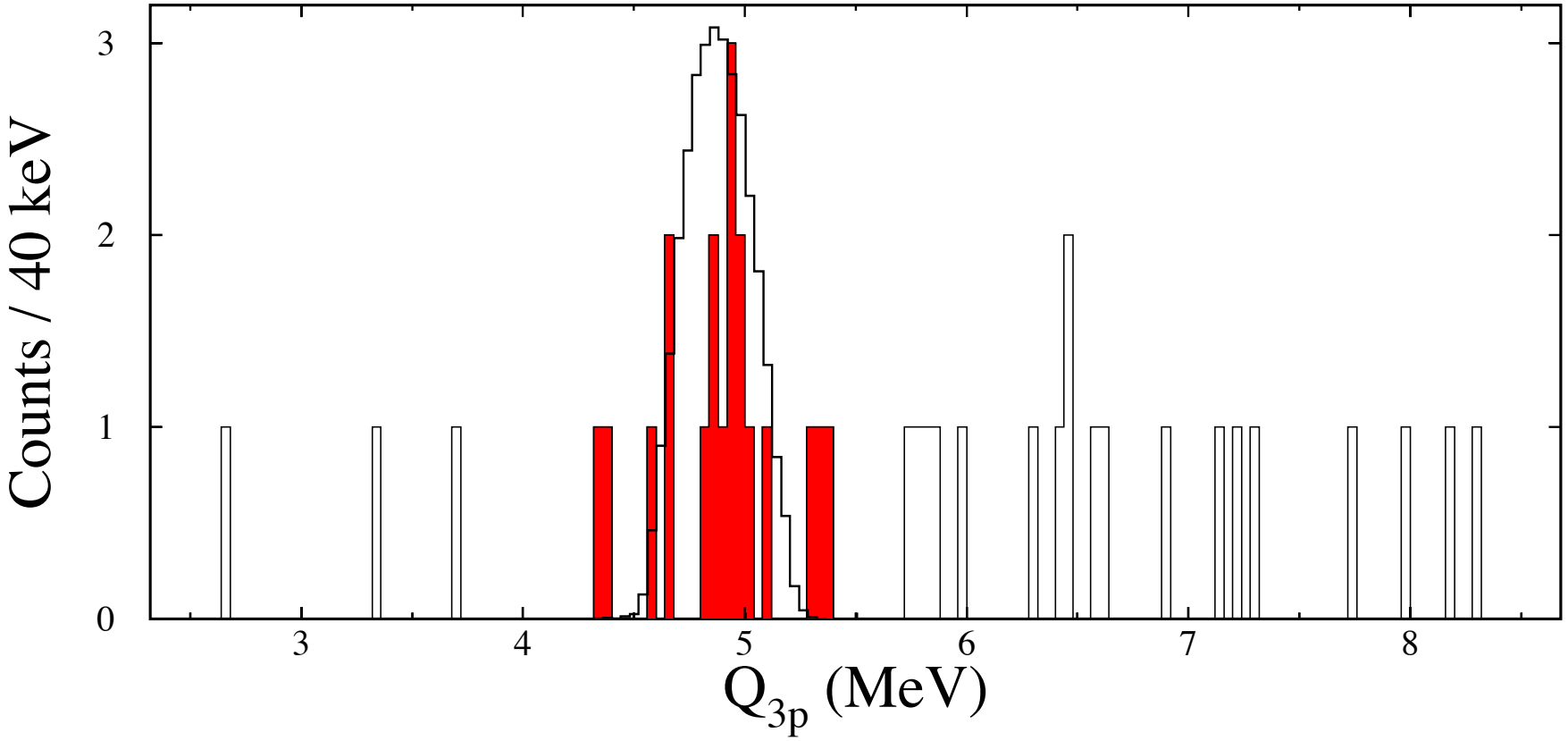
E(^{31}Cl) = 6.674(6) MeV



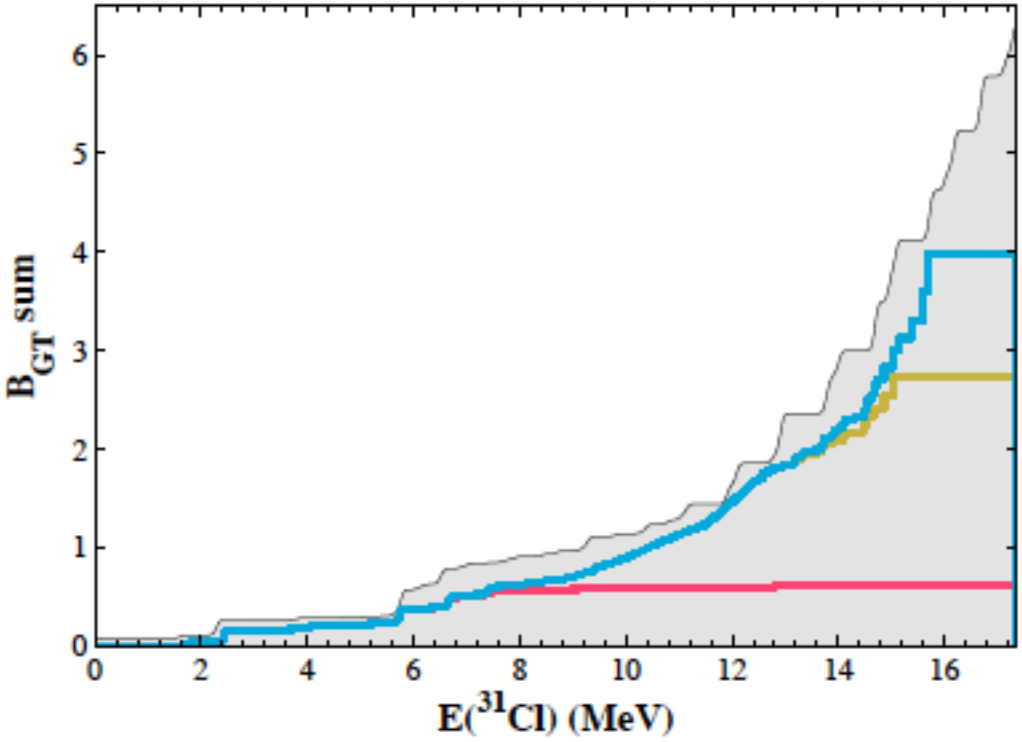
β3p-decay

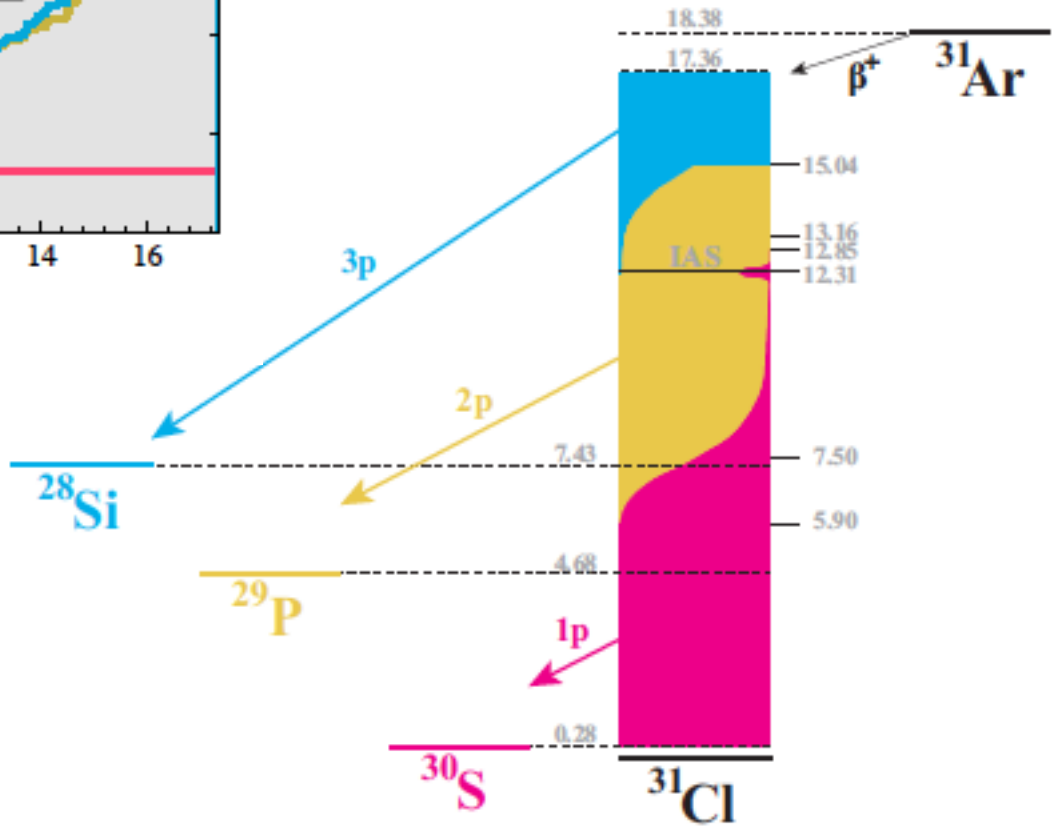
19 events from the IAS in ^{31}Cl

41 3-particle events remaining
Approx. ¼ is background



β3p-decay


B_{GT} sum
$E(^{31}Cl)$ (MeV)


18.38
17.36
β+
31Ar
15.04
13.16
12.85
IAS
12.31
3p
2p
7.43
7.50
5.90
4.68
29P
1p
0.28
28Si
30S
31Cl

β3p-decay

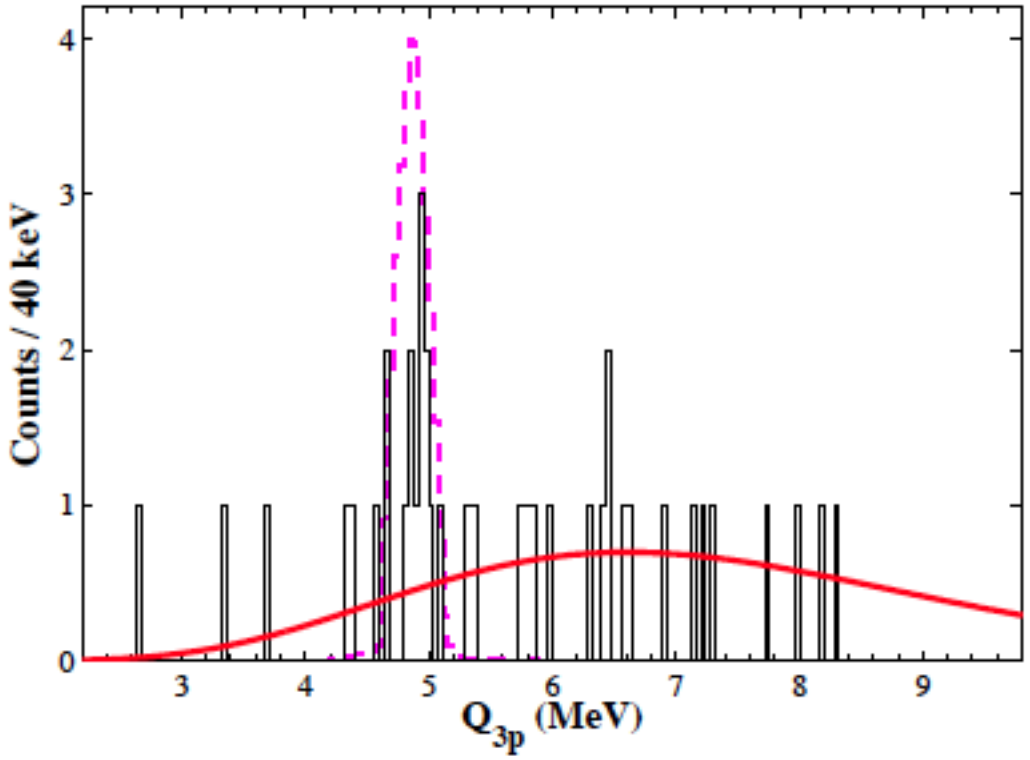


Figure 1: (Colour online) Q_{3p} calculated for multiplicity-three events. The dashed histogram is a simulation of a 3p-decay of the IAS in ^{31}Cl to the ground state in ^{28}Si. The full curve is the χ^2-distribution from Fig. 5 folded with itself three times and scaled manually to fit the data.

Phase-space – level density - penetrability

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New beamtime October 2014

- IS476+is577 12+5 shifts
  - Spin and decay properties of near proton threshold resonances in ^{30}S of astrophysical relevance. Special emphasis in the detection of low energy protons.
  - More statistics for 3p branches
  - SETUP: New IS decay station + highly performing charged particle detection system + upgraded electronics & DAQ