



SEP

CERN-PSCC

88-14

CERN LIBRARIES, GENEVA



SC00000665

CERN/PSCC/88-14

PSCC/S113

1 March, 1988

CERN/ISOLDE

IP-48

SUMMARY

STUDY OF fp STATES IN NUCLEI WITH HIGH NEUTRON EXCESS

Strasbourg¹, Lyon², Madrid³, I N2 P3⁴ and ISOLDE⁵ Collaboration

P. Baumann¹, Ph. Dessagne¹, A. Huck¹, G. Klotz¹, A. Knipper¹
G. Marguier², Ch. Miehe¹, A. Povès³, H. Ravn⁵,
C. Richard-Serre⁴ and G. Walter

Spokesman : G. Walter

Contactperson : C. Richard-Serre

SUMMARY

Previous results obtained at ISOLDE on GT transitions in n-rich Na and Mg nuclei have shown the sharp decrease of excitation energy for fp states when $A > 29$.

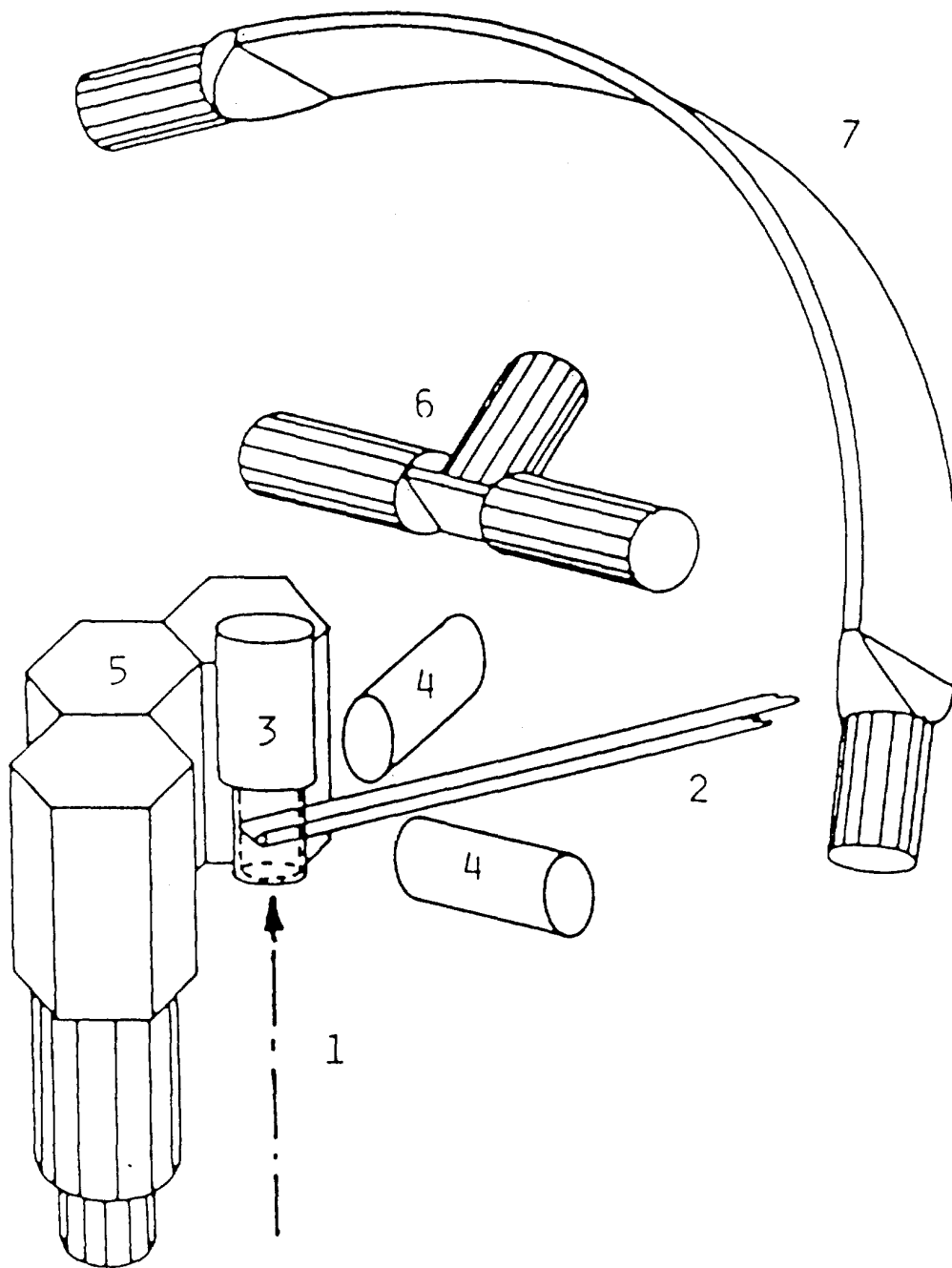
Independently, shell model calculations have revealed that the onset of a deformation region near $N = 20$ for Ne, Na and Mg nuclei was related to a sudden transition in the ground state properties with the appearance of a major $(sd)^{-2}(fp)^2$ component.

We propose to use the new possibilities of producing and detecting n-rich nuclei to study by γ and n spectroscopy the properties of fp states with different cores : around $N = 20$ (Na, Mg and Al) and $N = 28$ (Ar, K and Ca). In particular, the cases of ^{31}Mg ($N = 20$), ^{47}K ($N = 28$) and ^{48}K ($N = 29$) will be studied to improve the microscopic description of what was called "a new region of deformation".

Work in completion on detection techniques will allow to investigate the 2n channel in ^{30}Na , determining the related GT strength, and provide information on the 2 particule emission mechanism.

^3He beams could improve considerably the yields. Surface ionization and plasma sources with UC and molten germanium targets will be used. A total of 40 shifts is requested.

224673



IP-48 : Experimental set-up used in the test experiment

- 1) Ion beam 2) tape 3) $4\pi\beta$ counter
- 4) γ counters 5) neutron filter 6) 3 PM device
- 7) curved scintillator