

PROPOSAL TO THE PSCC COMMITTEE

NUCLEAR STRUCTURE OF NEUTRON DEFICIENT $Z \geq 64$ RARE EARTH NUCLEI
FROM GT-DECAYS

Madame Roswitha RAHMY

Listes 6 et 18 = 2 ex.

CERN¹ - Darmstadt² - Granada³ - Jülich⁴ - Orsay⁵ - Strasbourg⁶
CollaborationR.Barden², P.Kleinheinz⁴, O.Klepper², C.F.Liang⁵, P.Paris⁵,
M.Piiparinen⁴, A.Plochocki², C.Richard-Serre¹, E.Roeckl², B.Rubio^{3,4},
D.Schardt², J.Styczen⁴, G.Walter⁶

Spokesman: P.Kleinheinz

Contactwoman: C.Richard-Serre

SUMMARY

The β -decays of neutron-deficient nuclei above Gd and close to $N=82$ are dominated by the $\pi h_{11/2} \rightarrow \nu h_{9/2}$ GT-transition. These decays can give clear-cut structural identification of specific shell model excitations in the daughter nuclei which cannot be located in other experiments. Moreover the subsequent γ -decay may proceed through low-lying nuclear states of particular interest which are not accessible to measurement by other techniques.

Based on the results of a test beamtime in June 1985 we plan to carry out the following measurements:

- A) High resolution spectra of protons emitted following ^{147}Dy β -decay to determine the ground state mass of the one-proton nucleus ^{147}Tb with better than 5 keV accuracy.
- B) Conversion electron measurements for γ -transitions in ^{147}Tb to locate low-lying Pauli-blocked octupole septuplet members.
- C) Identification of ν and π particle-hole excitations across $N=82$ and $Z=64$ in ^{146}Gd and ^{148}Dy
- D) Alpha-gamma coincidence measurements for high precision determination of relative high- and low-spin isomeric masses in odd- Z $N=82$ and 84 nuclei
- E) Test measurements for selective ^{152}Yb production with Ta powder target needed for determination of the absolute GT transition strength compared to the $3(N-Z)$ related sum rule limit.

CERN LIBRARIES, GENEVA



Geneva 1986

CM-P00044204

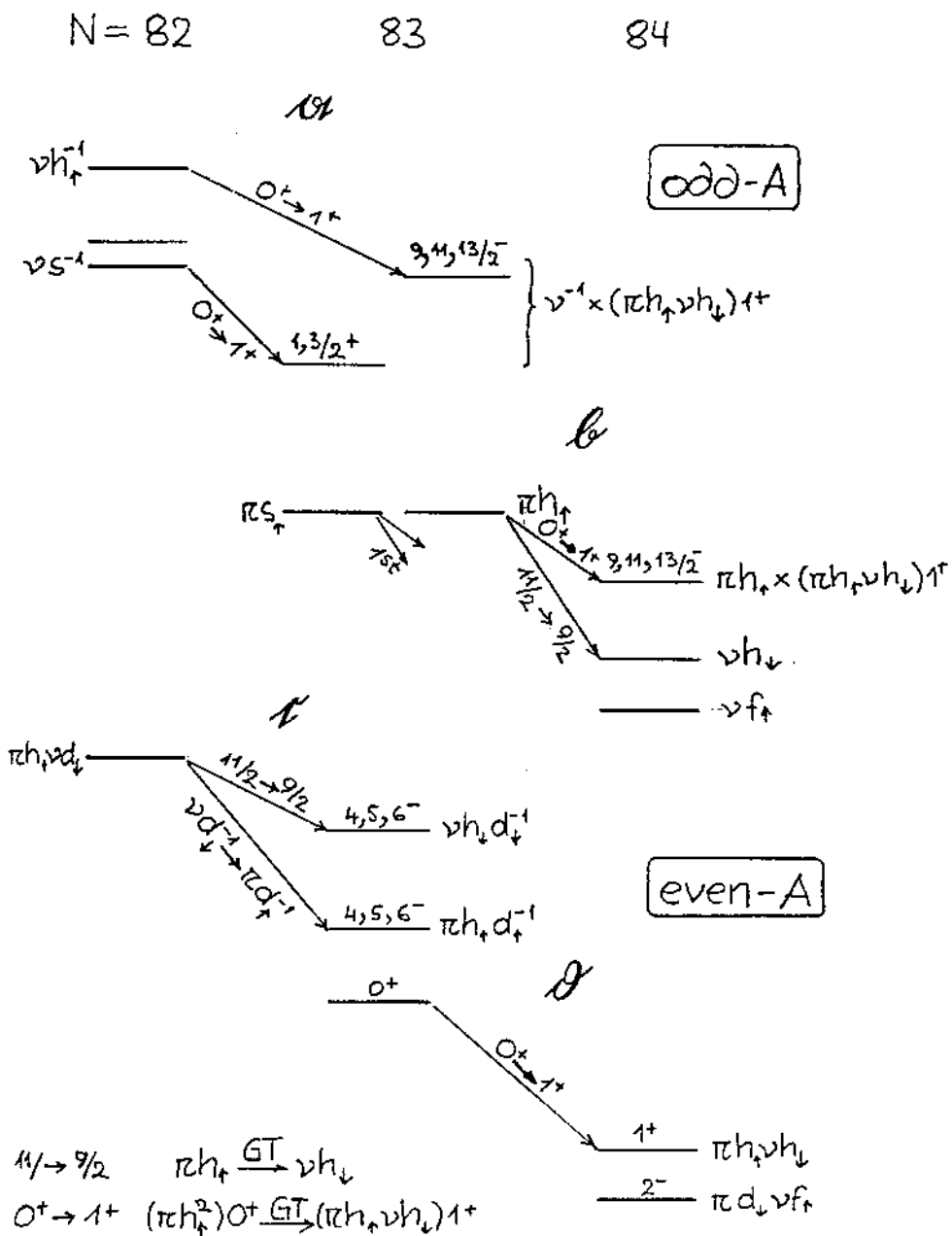


Fig. 1: Schematic representation of the $\pi h_{11/2} \rightarrow \nu h_{9/2}$ GT-decays in odd- and even-A nuclei above ^{146}Gd