High Resolution $(\vec{d},t)$ Study of ^{185}W ◇

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The present studies were undertaken with the main purpose to investigate more quantitatively the phenomenon of the fragmentation of the Nilsson strength [1] at the upper end of the region of deformation where there is the tendency toward a collapse of the known "fingerprint patterns" in the one quasiparticle transfer reactions.

The ^{186}W$(\vec{d},t)^{185}$W reaction was studied using a 22 MeV polarised from the Munich MP tandem accelerator. The outgoing tritons were analysed with the Q3D magnetic spectrograph and detected by the 1.8 m long focal plane detector [2]. The tungsten target with about 125 μg/cm^2 thickness enriched in ^{186}W to 99.8% was prepared by evaporating W onto a 5.6 μg/cm^2 carbon foil backing.

Polarized angular distributions were measured at 11 scattering angles between 8° and 50°. The single spectra created by a special computer trace reconstruction procedure cover a range up to about 3 MeV. The best resolution of FWHM=4 keV has been achieved in the middle area of the detector at forward angles. The excitation energies were obtained after the calibration of the (d,t) peaks with l=1 using the preliminary data from the new (n,γ) measurements carried out at the Nuclear Physics Institute at Řež near Prague. This procedure gives an energy accuracy better than 1 keV over the whole energy range.

Fig.1 demonstrates the quality of the measurements with polarized deutrons. The data evaluation is in progress.

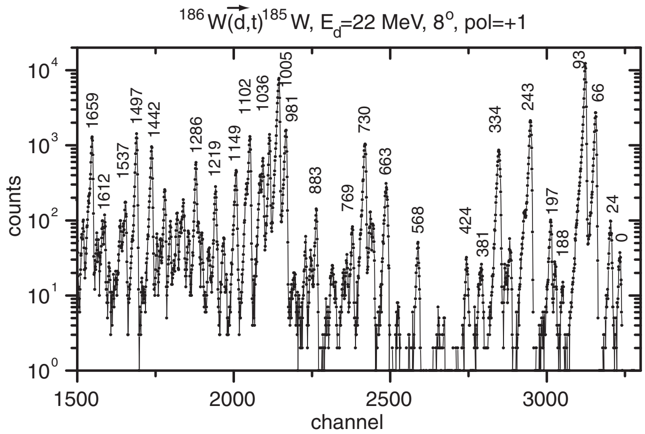

Fig. 1: An example of the ^{186}W$(\vec{d},t)^{185}$W spectra measured at the Q3D spectrograph. The prominent peaks are marked by their energy in keV.

References

[1] R.F. Casten, D.D. Warner and J.A. Cizewski, Nucl.Phys. **A333** (1980) 237

[2] E. Müller-Zanotti *et al.*, Nucl. Instr. Meth. **A310** (1991) 706

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