Measurement of the ^{114}Cd($\vec{d}$,t)^{113}Cd–Reaction ◇

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The ^{113}Cd nucleus plays an important part in the understanding of nuclear synthesis because of its influence on the relative abundances of the isotopes in this mass region. It also provides a good test for the Interacting Boson Fermion Model (IBFM), [1]. The even–even core ^{112}Cd is well described by the U(5) vibrational limit of the Interacting Boson Model (IBM), [2]. This allows to perform IBFM calculations varying only the coupling of the odd neutron to the even–even core. The parameters of the Hamiltonian describing the system are further restricted by considering semi–microscopic arguments. The established low-lying intruder states of the ^{112}Cd core are not included in the IBM–model space.

We used the 25MeV polarized proton beam of the Munich tandem accelerator to measure the ^{114}Cd($\vec{d}$,t)^{113}Cd reaction using targets of $96\frac{\mu g}{cm^2}$ ^{114}Cd and the Q3D magnetic spectrograph with the 1.8m long focal plane detector. Data of 11 angels between 8 and 45 degrees were collected with the polarized deuteron–beam (200nA on target) of our Lamb-Shift source. We will be able to assign spin and parity and to extract spectroscopic factors of the ^{113}Cd nuclear levels up to 2.4MeV excitation energy. Part of a characteristic spectrum with a resolution of 6 to 7keV (compare with the resolution of 12keV in [3]) is displayed in fig.1. The groundstate is on the right hand side, excited levels up to approximately 1.5MeV expand to the left hand side. The evaluation of data is in progress.

References

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[3] L.H. Goldmann *et al.*, Phys. Rev. **179** (1969) p.1172

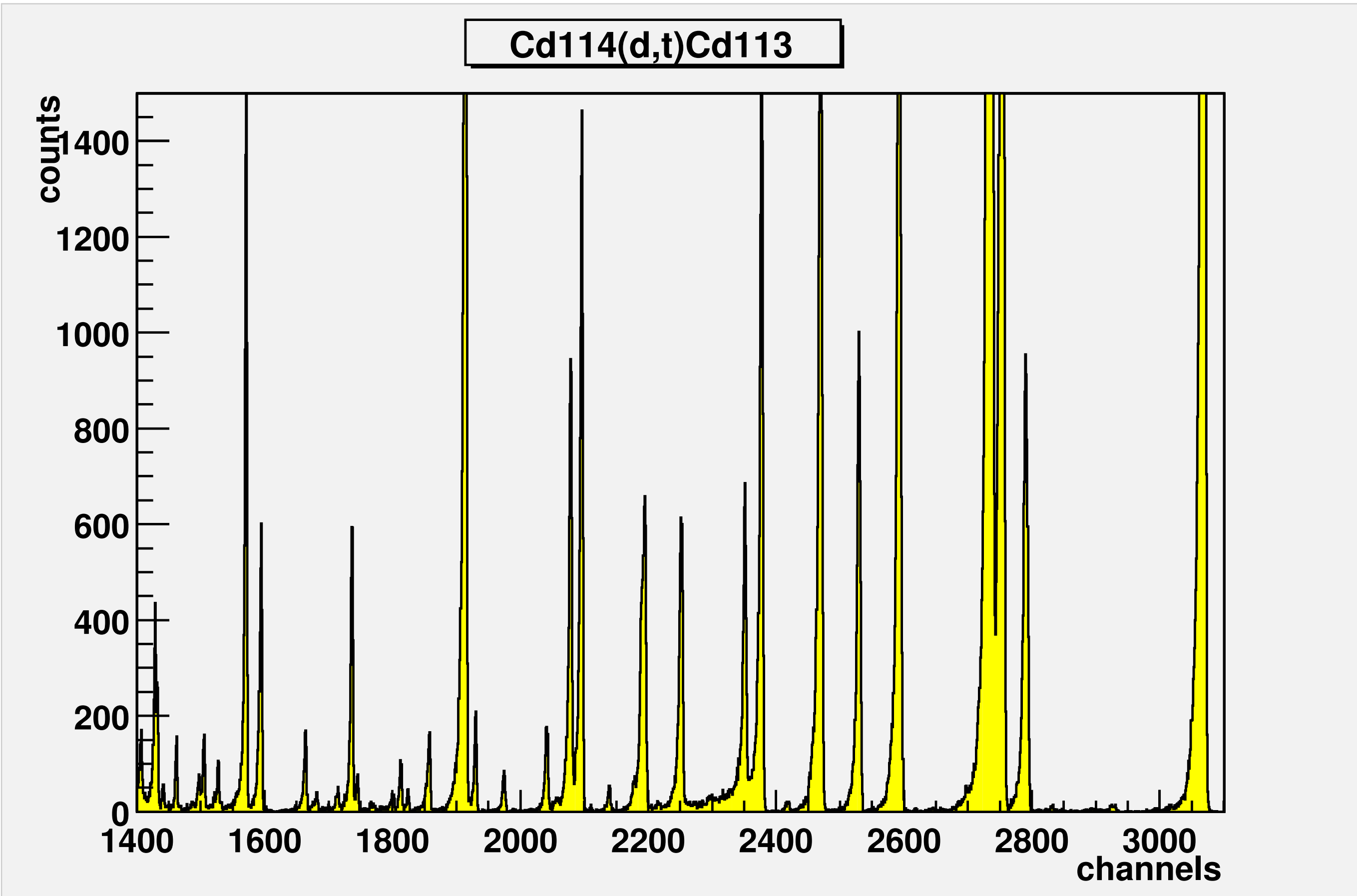

Fig. 1: Displayed is part of the ^{113}Cd-Spectrum up to an excitation energy of about 1.5MeV. The Groundstate is visible at channel 3050. The resolution is 6 to 7keV.

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