^{118}Sn(p,t)^{116}Sn Reaction

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In the framework of a systematic study of tin isotopes via the (p,t) reaction ^{118}Sn(p,t)^{116}Sn has been studied in a high resolution experiment using the 24.6 MeV proton beam from the Munich MP Tandem accelerator. The 86μg/cm^2 thick ^{118}Sn isotopic enriched (98.8%)target has been evaporated on a 7.5 μg/cm^2 carbon backing. The reaction products have been analyzed with the Q3D spectrograph, from 10^o up to 52.5^o in three different magnetic field settings in order to reach an excitation energy of the residual ^{116}Sn nucleus of about 3900 keV. The outgoing tritons have been detected and identified in the cathode strip detector [1] of the Q3D focal plane. 42 transitions to the levels of ^{116}Sn up to an excitation energy of 3.904 MeV have been identified and the corresponding differential cross sections have been determined allowing to assign spins and parities to the observed levels. In Fig. 1 the experimental angular distributions for the transitions to several ^{116}Sn levels are reported together with the theoretical curves obtained assuming a semimicroscopic dineutron cluster pick-up mechanism. The DWBA calculations have been performed in a finite-range approximation using the computer code TWOFNR [2]. The used optical model parameters for the proton entrance channel and for the triton exit channel are the same reported in reference [3].

References

[1] H.-F. Wirth *et al.*, Annual report 2000, p. 71
[2] M. Igarashi, computer code TWOFNR (1977) unpublished.
[3] P. Guazzoni, L. Zetta, A. Covello, A. Gargano, G. Graw, R. Hertenberger, H.-F. Wirth, and M. Jaskóla, Phys. Rev. **C69** (2004) 024619

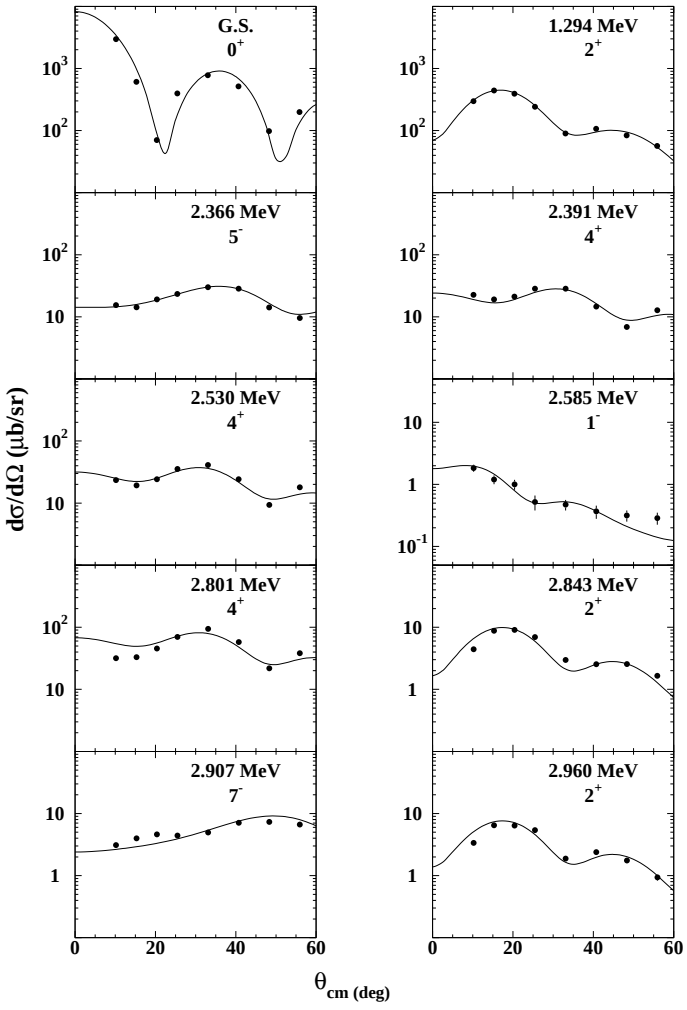

Fig. 1: Experimental (dots) and theoretical (solid lines) angular distributions for the transitions to several ^{116}Sn levels