Levelscheme of ^{110}Sn from the ^{112}Sn(p,t)^{110}Sn Reaction

P. Guazzoni [a], L. Zetta [a], A. Covello [b], A. Gargano [b], G. Graw, R. Hertenberger, H.-F. Wirth, B.F. Bayman [c], and M. Jaskóla [d]

[a] Dipartimento di Fisica dell'Università and I.N.F.N, I-20133 Milano, Italy
[b] Dipartimento di Scienze Fisiche dell'Università and I.N.F.N, I-80126 Napoli, Italy
[c] School of Physics and Astronomy, University of Minnesota, Minneapolis, U.S.A.
[d] Soltan Institute for Nuclear Studies, Warsaw, Poland

The nuclei near the Z=50 closed shell have been the object of many experimental and theoretical investigations. Due to the large number of stable isotopes, the Sn isotopes are particularly suited for studing the changes in the nuclear structure when the N=51 to N=82 neutron shells are filled. In a systematic study of (p,t) reactions on Sn isotopes we have studied ^{122}Sn(p,t)^{120}Sn [1], ^{120}Sn(p,t)^{118}Sn [2], ^{114}Sn(p,t)^{112}Sn [3] and, with the present work, ^{112}Sn(p,t)^{110}Sn. Some preliminary experimental results have been reported previously [4].

The ^{112}Sn(p,t)^{110}Sn reaction has been studied in a high resolution experiment at an incident proton energy of 26 MeV. Angular distributions of 25 transitions, including two doublets, have been measured to levels of ^{110}Sn up to an excitation energy of 4.317 MeV. A DWBA analysis, assuming a semimicroscopic dineutron cluster pick-up mechanism, has been performed, allowing to determine the angular momentum transfer and assign spin and parity values to 27 levels.

The experimental data (dots) and the results of the calculations (solid lines) for different L-transfers are compared in Fig. 1. A good agreement is found, thanks to the clear structure of the angular distributions rather well described by the DWBA calculations with the TWOFNR code [5].

References

[1] P. Guazzoni *et al.*, Phys. Rev. **C60** (1999) 054603
[2] P. Guazzoni *et al.*, Annual report 2003, p. 15
[3] P. Guazzoni *et al.*,Phys. Rev. **C69** (2004) 024619
[4] P. Guazzoni *et al.*, Annual report 2001, p. 10
[5] M. Igarashi, computer code TWOFNR (1977) unpublished

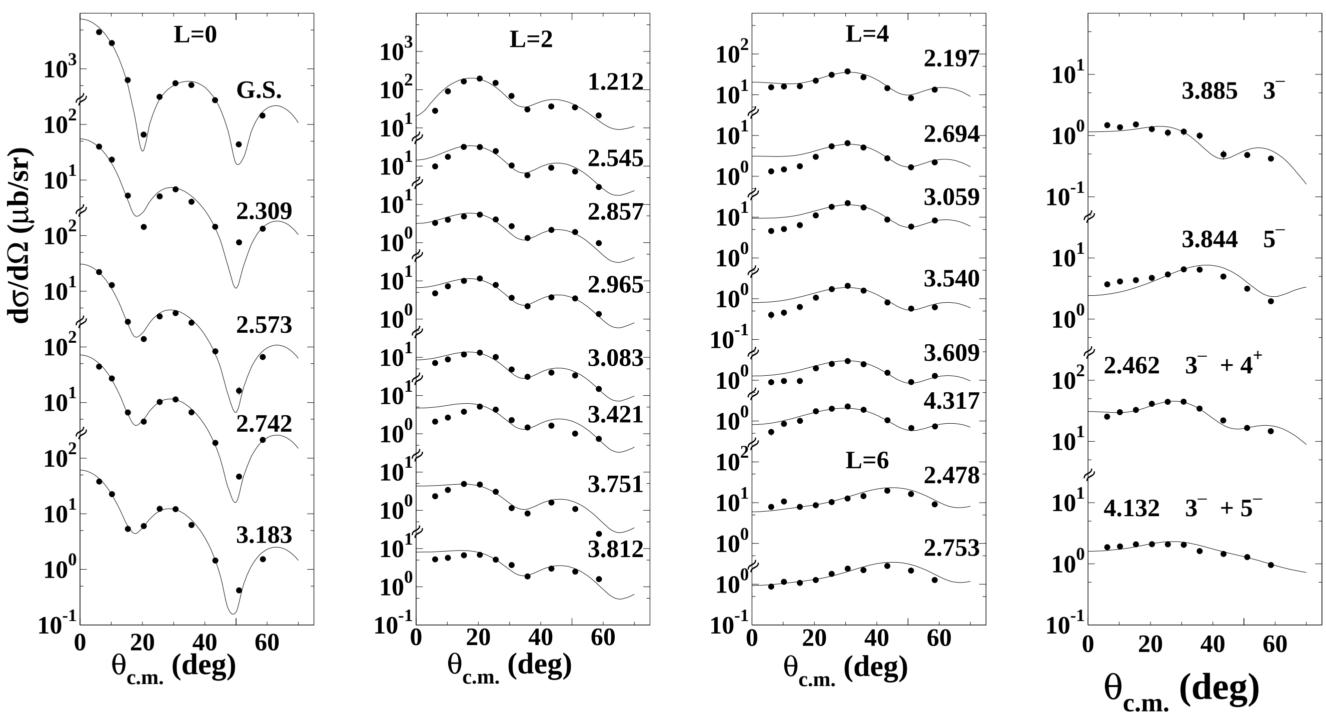

Fig. 1: Experimental (dots) and theoretical (solid lines) angular distributions for all the identified transitions to the ^{110}Sn levels