Nuclear Structure of ^{193}Os:Transfer Experiment and IBM-related Model ◇

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^{193}Os is the heaviest Osmium isotop accessible by one neutron transfer reaction. Data from ($\vec{d}$,p) experiments with high resolution at the Munich Q3D spectrograph provide new information on the nuclear structure of this odd-even nucleus. Spin, parity and spectroscopic factors of levels with excitation energies up to 1.7MeV are deduced from the angular distributions of the ($\vec{d}$,p) reaction [1]. Energy considerations are not sufficient to compare the structure of a nucleus with the model. Spectroscopic factors of levels up to 1800keV are displayed in the following graphics. We compare experiment with IBFM-2 and SUSY model calculations.

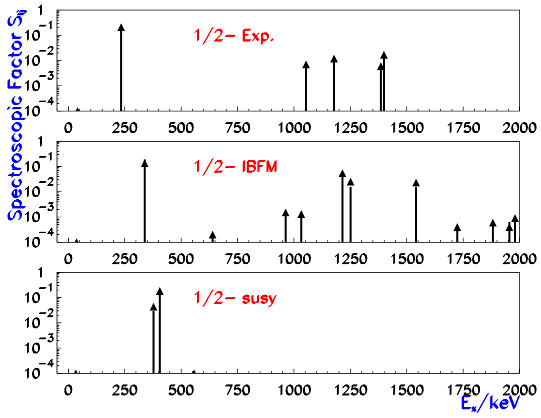

Fig. 1: Spectroscopic factors for J=(1/2)$^-$ states: Experiment, IBFM-2 and Susy calculations.

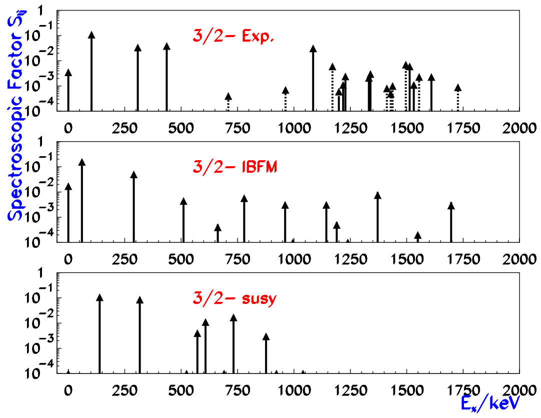

Fig. 2: Spectroscopic factors for the J=(3/2)$^-$ states: Experiment, IBFM-2 and Susy calculations.

In the interacting boson-fermion approximation model (IBFM-2) the odd-even nucleus is described by the inert core (^{194}Os) to which the odd neutron (hole) couples. Our calculation takes into account 5 negative parity states, namely: J=(1/2)$^-$, (3/2)$^-$, (5/2)$^-$, (7/2)$^-$ and (9/2)$^-$. Parameters are basicallly taken from Bijker et al. [2]. The SUSY (supersymmetry) model is based on group theoretical considerations. The U(6/12) supersymmetry is for ^{193}Os the relevant symmetry due to the low-lying neutron orbits with J=(1/2)$^-$, (3/2)$^-$, and (5/2)$^-$. We can see, that the IBFM-2 calculation reproduces the lower lying nuclear excited states quite well. The level scheme given by SUSY only approximately resembles the experimental data.

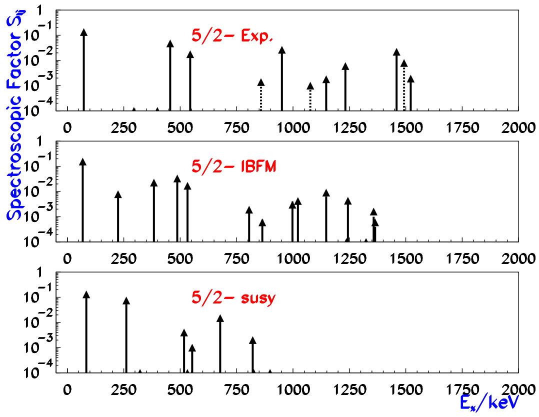

Fig. 3: Spectroscopic factors for the J=(5/2)$^-$ states: Experiment, IBFM-2 and Susy calculations.

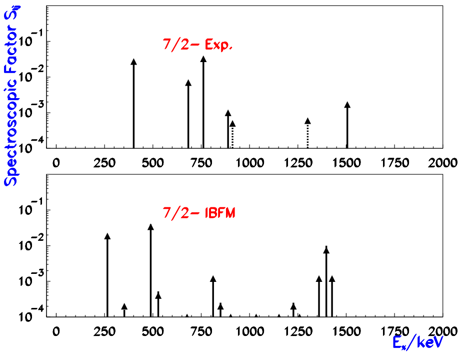

Fig. 4: Spectroscopic factors for the J=(7/2)$^-$ states: Experiment and IBFM-2 calculations. (SUSY can not give spectroscopic factors for these levels.)

References

[1] Y. Eisermann *et al.* Annual report 2001, p. 12
[2] Bijker *et al.*, Nuc. Phys. **A316** (1979) 13

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