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Title: **New superdeformed and "high spin" structures in the A=80-100 and A=150 regions.**
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New, highly effective arrays for γ-ray spectroscopy like EUROBALL and Gammasphere, combined with state of the art ancillary detectors and/or recoil mass separators for channel selection, have during recent years allowed identification and in-beam γ-spectroscopic studies of very neutron deficient nuclei in the $A \approx 80 - 100$ mass region. These nuclei have so far been produced in heavy-ion induced fusion evaporation reactions utilizing stable beams and targets. This mass region shows a richness of phenomena. Here the heaviest $N = Z$ nuclei are identified and enhanced neutron-proton correlations are expected when protons and neutrons occupy identical orbitals. At the same time the vicinity to the proton drip line may influence the stability and structure of the most neutron deficient nuclei. The nucleus ^{100}Sn is the heaviest $N = Z$ doubly magic nucleus believed to be bound. ^{100}Sn and its neighbours are key nuclei for understanding the nuclear shell model. New "high spin" results on some neighbours of ^{100}Sn will be presented.

The A=80-90 region was early predicted to be a favoured region for observation of superdeformed (SD) structures. A number of SD-bands have been reported for nuclei with A=80-91. Large energy gaps at SD-shapes for especially N=Z=38,42,44,46 stabilize the structures. The $N = Z$ nucleus ^{88}Ru is predicted to have a "doubly magic" SD structure with two protons and two neutrons in the lowest N=5 intruder orbitals. Recently SD structures have been reported for ^{88}Mo [1], ^{89}Tc [2] and ^{91}Tc [3] which are the heaviest nuclei in this region with known SD-structures. The SD-band in ^{91}Tc shows unexpected features. The SD-structures of these nuclei will be discussed.

In ^{154}Er a new SD-band has been observed in an experiment at EUROBALL [4]. The structure of this new band and the previously observed SD-band in ^{154}Er will be discussed.

References

[1] T.Bäck et al., Eur. Phys. J.**A6**, 391 (1999).

[2] B.Cederwall et al., Eur. Phys. J.**A6**, 251 (1999).

[3] E.Ideguchi et al. Phys. Lett. **B492**, 245 (2000).

[4] K.Lagergren et al. , to be published.

Invited talk.