

Reply to "Comment on 'Lack of evidence for a superdeformed band in ^{192}Pb '"

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(Received 15 December 1993)

In reply to the preceding Comment, we wish to stress that lack of consistency between experiments of similar quality justifies our claim that further searches for a superdeformed band in ^{192}Pb with more powerful instruments are called for. We believe that the main results presented in the Comment support this conclusion.

PACS number(s): 21.10.Re, 23.20.Lv, 27.80.+w

In the preceding Comment [1] a more detailed account is presented of the experiment and analysis that led to the original report [2] of a superdeformed band in ^{192}Pb . Furthermore, this Comment also presents preliminary data from a new measurement and discusses possible causes for the discrepancy between the results of Ref. [2] and those reported in Ref. [3].

We note that the strength of the proposed superdeformed band ($\sim 0.35\%$ of the reaction channel of interest) is given for the first time. This very small intensity is at the detection limit, not only of the Argonne-Notre Dame BGO γ -ray facility (which we used, cf. Ref. [3]) as claimed in the Comment, but also of the HERA spectrometer (used in Ref. [2]). A visual inspection of the two figures in the preceding Comment illustrates this point.

For example, the intensity patterns seen in both figures for the proposed superdeformed transitions do not match the expectations for this type of excitation: The intensities above 500 keV are too small in their Fig. 1 and there is little evidence for the Doppler-broadened transitions above 424 keV in their Fig. 2. In fact, the preceding Comment illustrates the main point of our original paper that studies of superdeformation in ^{192}Pb with fusion evaporation reactions are indeed very difficult because of a number of unfavorable experimental conditions (fission, presence of strong competing reaction channels, presence of long-lived isomers, etc.) The fairly intense contaminating γ -ray transitions present in Figs. 1 and 2 in the Comment, as well as in Fig. 2 in Ref. [3], demonstrate this point.

At this stage, it is difficult to quantify the possible advantages of the first experiment over the second one. It seems to us that the lack of consistency between two measurements which were performed with the same reaction, and which resulted in an amount of data differing by at most a factor of 2, justifies our claim that further studies are needed to establish the presence of a superdeformed band in ^{192}Pb , unambiguously. With the large detector arrays currently coming into operation, such studies now become feasible.

To summarize, we believe that the Comment by Henry *et al.*, is in line with most of the results presented in Ref. [3]. Further searches for a superdeformed band in ^{192}Pb with more powerful instruments are called for.

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[1] E. A. Henry *et al.*, Phys. Rev. C **49**, 2849 (1994), the preceding Comment.

[2] E. A. Henry *et al.*, Z. Phys. A **338**, 469 (1991).

[3] A. J. M. Plompen *et al.*, Phys. Rev. C **47**, 2378 (1993).