Comment on “Taleyarkhan et al. Reply:”

In their Reply [1] to my previous Comment [2], Taleyarkhan and coauthors measure their detectors’ responses to a 252Cf source, concluding that the resulting spectra differ substantially from the cavitation-fusion spectra published earlier in their Letter [3]. On the contrary, I conclude that the two data sets are qualitatively consistent.

*Nevada* neutron spectra. To compare proton-recoil spectra, their scales must first be calibrated, typically to equivalent electron energy via γ calibration sources. Though the authors provided 137Cs and 60Co γ calibrations in their Letter (see Fig. 1(a) of my previous Comment), in their Reply, they do not provide a γ calibration along with their 252Cf spectrum. Nevertheless, their detector’s response to 252Cf, and the corresponding 137Cs and 60Co γ calibrations, are given in Figs. 5(b) and 4 of Ref. [4]. Comparison of the calibrated and the uncalibrated 252Cf spectra shows that the detector’s gain was approximately 10% less in the Reply than in the Letter. Using this calibration for the Reply spectrum, Fig. 1 shows the Reply’s 252Cf spectrum to be consistent with the Letter’s cavitation-fusion spectrum.

![FIG. 1: (color online). The aggregate background-subtracted cavitation-fusion proton-recoil spectrum (Fig. 12 of the Letter’s supplement) compared with the 252Cf spectrum from the Reply. Note that the “PRL” spectrum from Fig. 1(a) of the Reply is the same as the cavitation-fusion spectrum here, though data below channel 10 were removed from the Reply. As discussed in the text, the Reply spectrum is cross-calibrated to have a gain of 10% less than the Letter spectrum. For qualitative comparison, the simulated DD-fusion response from my previous Comment, with arbitrary vertical normalization, is also shown. See Refs. [6, 7] for examples of experimental DD-fusion proton-recoil spectra.](image)

**NaI(Tl) gamma spectra.** In Fig. 1(b) of the Reply, the authors compare their “cavitation on” γ spectrum against an experimental 252Cf γ spectrum. As shown in Fig. 15(a) of the Letter’s supplement (reproduced here in Fig. 2), the “cavitation on” spectrum is within approximately 2% of the “cavitation off” background spectrum. Consequently, they are comparing the 252Cf spectrum against the natural γ background, not the cavitation fusion γ signal. For example, the peak at channel 14, also present in their undeuterated control runs, is due to 40K’s 1.46 MeV γ, the predominant feature of the terrestrial γ background [8]. These features do not appear in the Reply spectrum because their relatively intense 252Cf source, placed only 30 cm from the detector, overwhelms the natural γ background.

The appropriate comparison would be between the 252Cf γ spectrum and the background-subtracted cavitation-fusion γ signal. In this case, however, the subtracted signal is a small fraction of the background, and the error on a channel’s count difference would be of greater magnitude than the difference itself. For example, in channel 14, there were approximately 970 ‘on’ counts and 940 ‘off’ counts, yielding a difference of 30 ± 40. Such a comparison would therefore be unfortunately inadequate to distinguish between 252Cf and DD-fusion.

![FIG. 2: Fig. 15(a) of the Letter’s supplement.](image)

In conclusion, Taleyarkhan and coauthors’ cavitation-fusion spectra are consistent with their own 252Cf spectra.

I thank S. Putterman for valuable discussions. This work is supported by DARPA.

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February 1, 2007
PACS numbers: 78.60.Mq, 25.45.-z, 28.20.-v, 28.52.-s