Email Documentation re: "Nuclear Emissions During Acoustic Cavitation," by R. P. Taleyarkhan, C. D. West, J. S. Cho, R. T. Lahey,Jr., R. I. Nigmatulin, R. C. Block

This file presents Email correspondence between R.P.Taleyarkhan and Dr. D. Shapira who was tasked by ORNL management to set up an independent neutron data acquisition system to monitor nuclear emissions during cavitation with chilled D-Acetone. Data taken by D. Shapira were requested for in-depth analysis by R. P. Taleyarkhan and his team which revealed that very statistically significant nuclear emissions were indeed occurring during bubble implosion/SL in this independently taken data (for expts. involving cavitation of chilled deuterated acetone).

This email correspondence includes two parts: (1) Acknowledgment by R.P.Taleyarkhan to 12/21/01 email from D. Shapira, (2) Email from D. Shapira mentioning that after he investigated his data, he agrees that his singles (neutron emission data spectra which were analyzed by us and him) did indeed also result in increases with cavitation during bubble implosion.

Date: Fri, 21 Dec 2001 11:17:08 -0500
From: "Rusi P. Taleyarkhan" <zrt@ornl.gov>
Subject: Re: singles spectra again (rpt->DanS,12/21/01)
To: Dan Shapira <shapira@mail.phy.ornl.gov>
Cc: taleyarkharp@email.cind.ornl.gov

Dan: Thank you for the honesty. We all make arithmetic mistakes and overlook things. At least you are ethical enough to accept. Yes. I did notice that the values you came up with were a bit different from mine, but I let it ride since, unlike a factor of 1.13 vs 1.077 that you were coming up with previously (which completely negates everything), we were now just quibbling about a tiny difference that could be due to the way in which you do the summing starting with a different bin no. I just let it pass since we have one more area to reasonably close with you. Let's now do the same and come to terms for the coincidence crap we're in.

With difference of 1152 over40 bins we get an average increase of about 29*8/channel - taking the average from the data with the PD detector of about 380*8/channel we now get an increase of ~7.5%. Since 1 sigma is about 0.29% (=100/sqrt(380*8*40)) statistically we are now about 20 sigmas *** INCIDENTALLY, THIS IS ALSO THE VALUE WE GET WHEN WE SUM UP ALL OF OUR DATA TAKEN WITH THE ELSCINT DETECTOR AND TAKE THE AGGREGATE *** WE ARE IN MUCH BETTER AGREEMENT THAN BEFORE RE: SINGLES NOW. FROM A PRACTICAL VIEW, WE ALL BELIEVE THIS IS IMPORTANT & SHOULD BE HIGHLIGHTED. TWO INDEPENDENT SYSTEMS GIVING THE SAME ANSWER. IF NOT PERFECT, CERTAINLY REDUCES DOUBTS FURTHER.

Date: Thu, 20 Dec 2001 19:02:07 -0500 (EST)
From: Dan Shapira <shapira@mail.phy.ornl.gov>
Subject: singles spectra again
To: taleyarkharp@ornl.gov
Cc: Dan Shapira <shapira@lera2.phy.ornl.gov>

Hi Rusi

When I got back I started looking at the data much more closely and discovered that the numbers I sent this morning (Dec. 20) where computed on the wrong spectrum not the one I gave you. You had the correct one which are all the singles.
So, with a shaking heart, I went on to calculate the ratios with method 1 and method 2 and thank goodness I did not make another mistake this morning. Whow!

The numbers below are with the correct spectrum and they agree with yours, I hope.

Rusi here are my numbers for the scanned data:

run 109 (with cavitation)
37 S(0- 8191)* 1.000E+00= 124895 run109.his 20-Dec-01 18:43
37 S(500- 5500)* 1.000E+00= 68901 run109.his 20-Dec-01 18:45
37 S(2000- 5500)* 1.000E+00= 43544 run109.his 20-Dec-01 18:45

37 S(72- 112)* 1.000E+00= 14771 run109.his 20-Dec-01 18:46

run 111 (without cavitation)
37 S(0- 8191)* 1.000E+00= 115928 run111.his 20-Dec-01 18:47
37 S(500- 5500)* 1.000E+00= 64064 run111.his 20-Dec-01 18:48
37 S(2000- 5500)* 1.000E+00= 40604 run111.his 20-Dec-01 18:48

37 S(72- 112)* 1.000E+00= 13530 run111.his 20-Dec-01 18:49

Summary:

The ratios are:
All channels = 1.077
500 - 5500 = 1.076
2000 - 5599 = 1.072

The difference for 72-112 region is 1241 which scales down to 1152!

I guess the difference is there for the singles also in our data
Sorry about the confusion!

Dan