Nuclear signature in LENR gas loading experiments

Greccio, 13th Int'l Workshop on Anomalies in Hydrogen Loaded Metals

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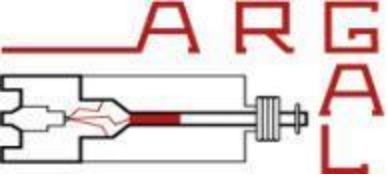
A.R.G.A.L.

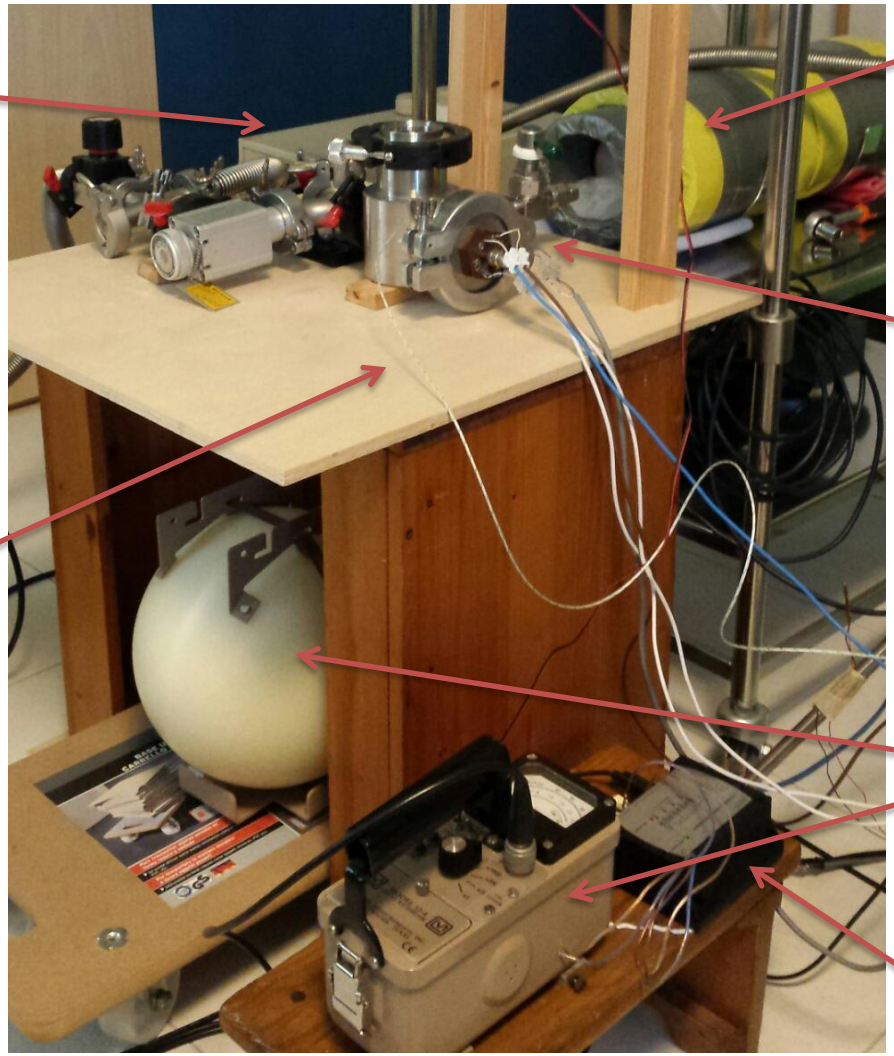
5-9 October 2018



Outline

- Setup overview
- The neutron detector
- Gas loading of Palladium thin layers experiments
- Neutron bursts and weak neutron activity
- Final conclusions

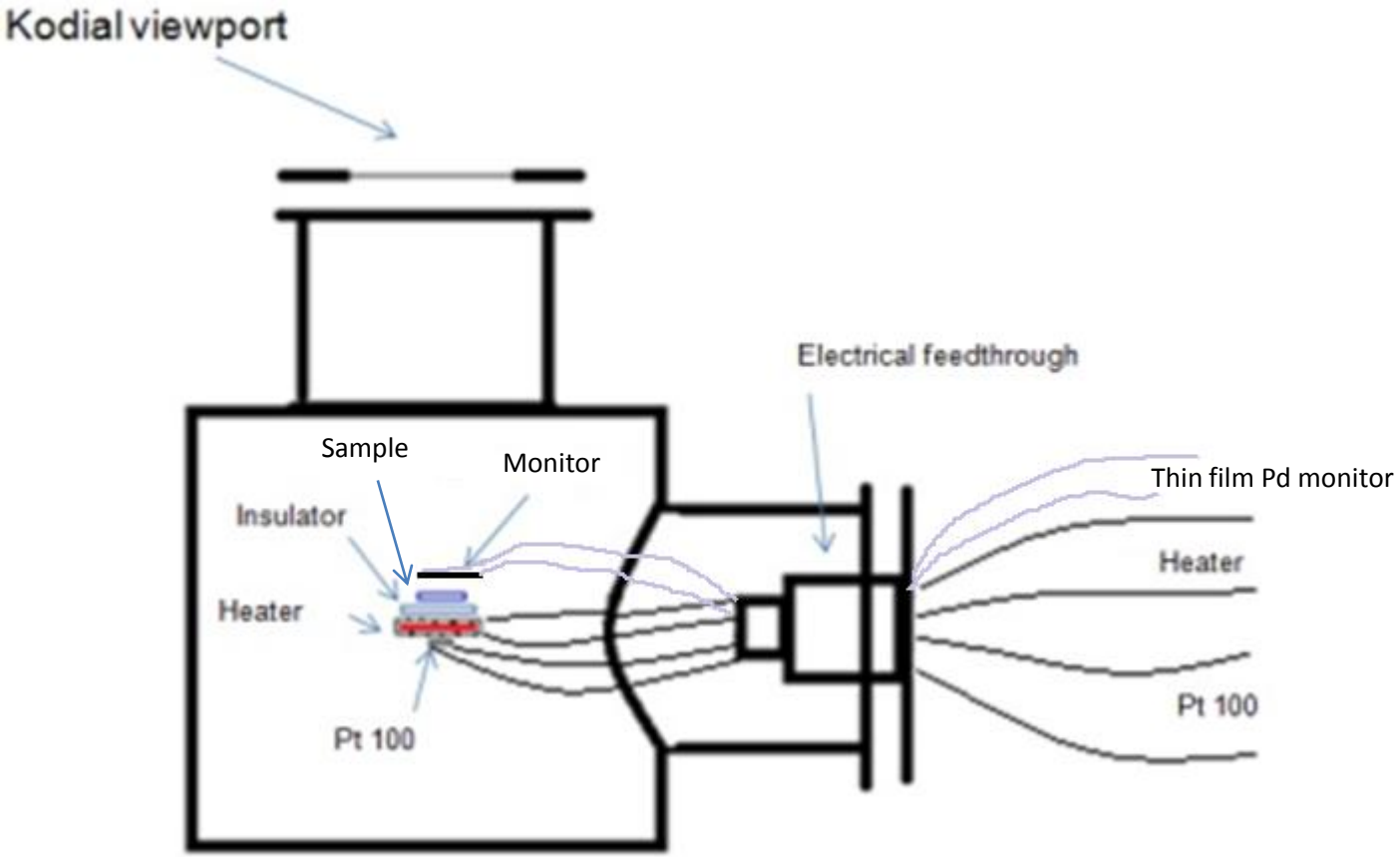
Setup overview



Ludlum 12-4 neutron meter

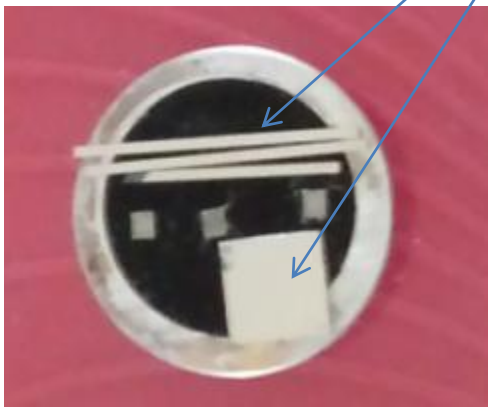
Setup management

Reactor 1 setup sketch

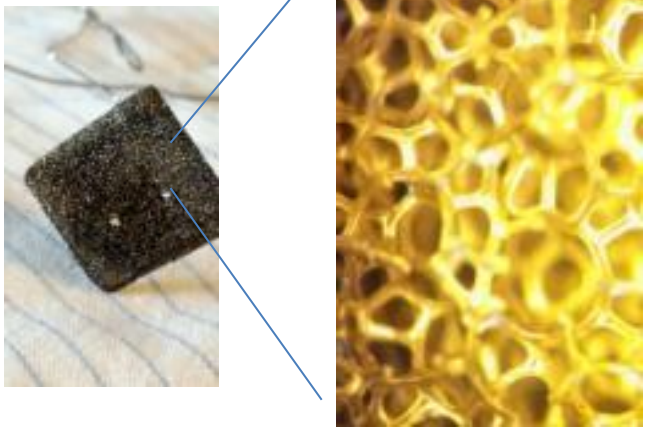


Thin film samples

example of samples with a thin palladium film deposited

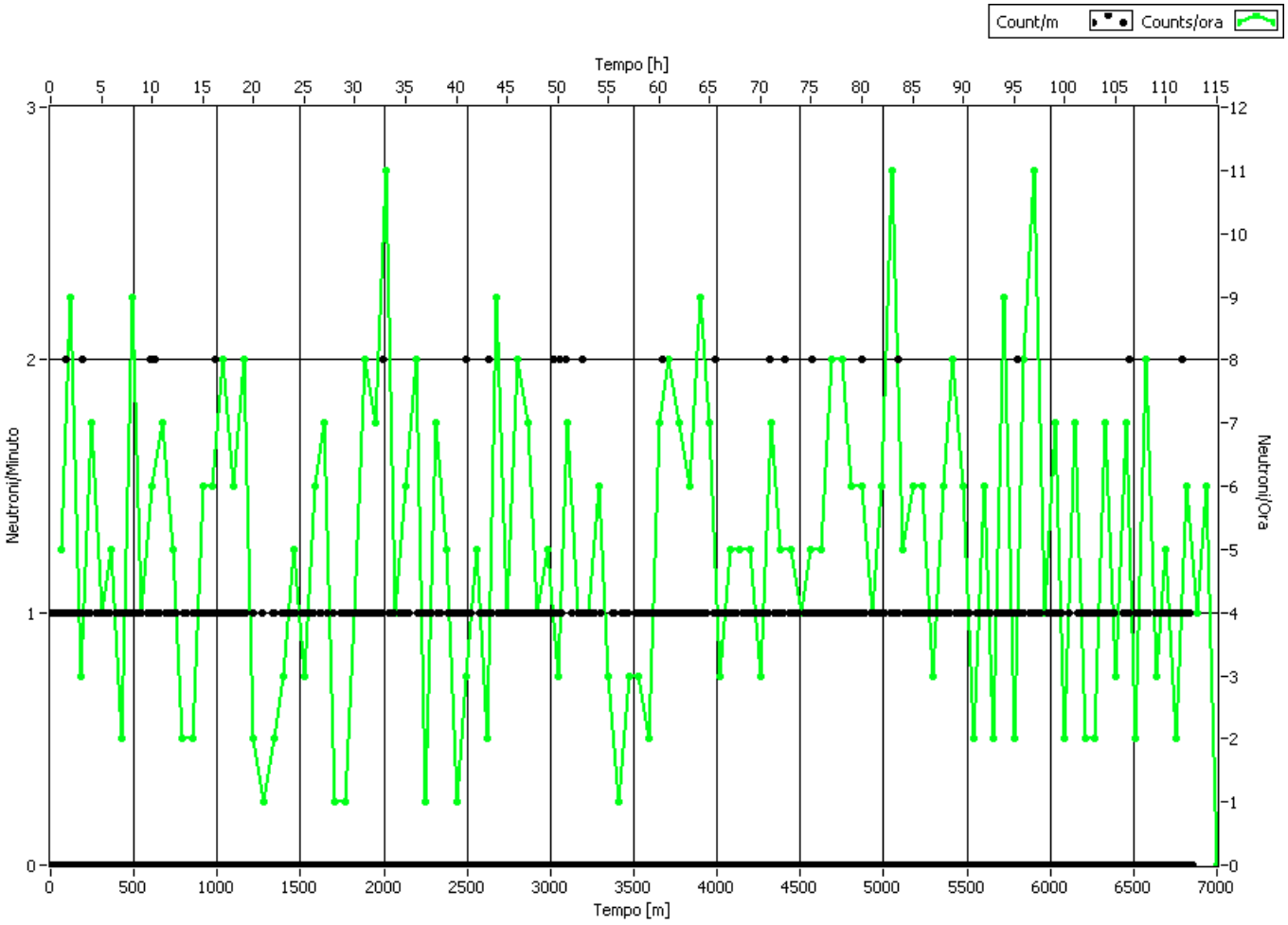


Pd electroplated Nickel sample



50 X

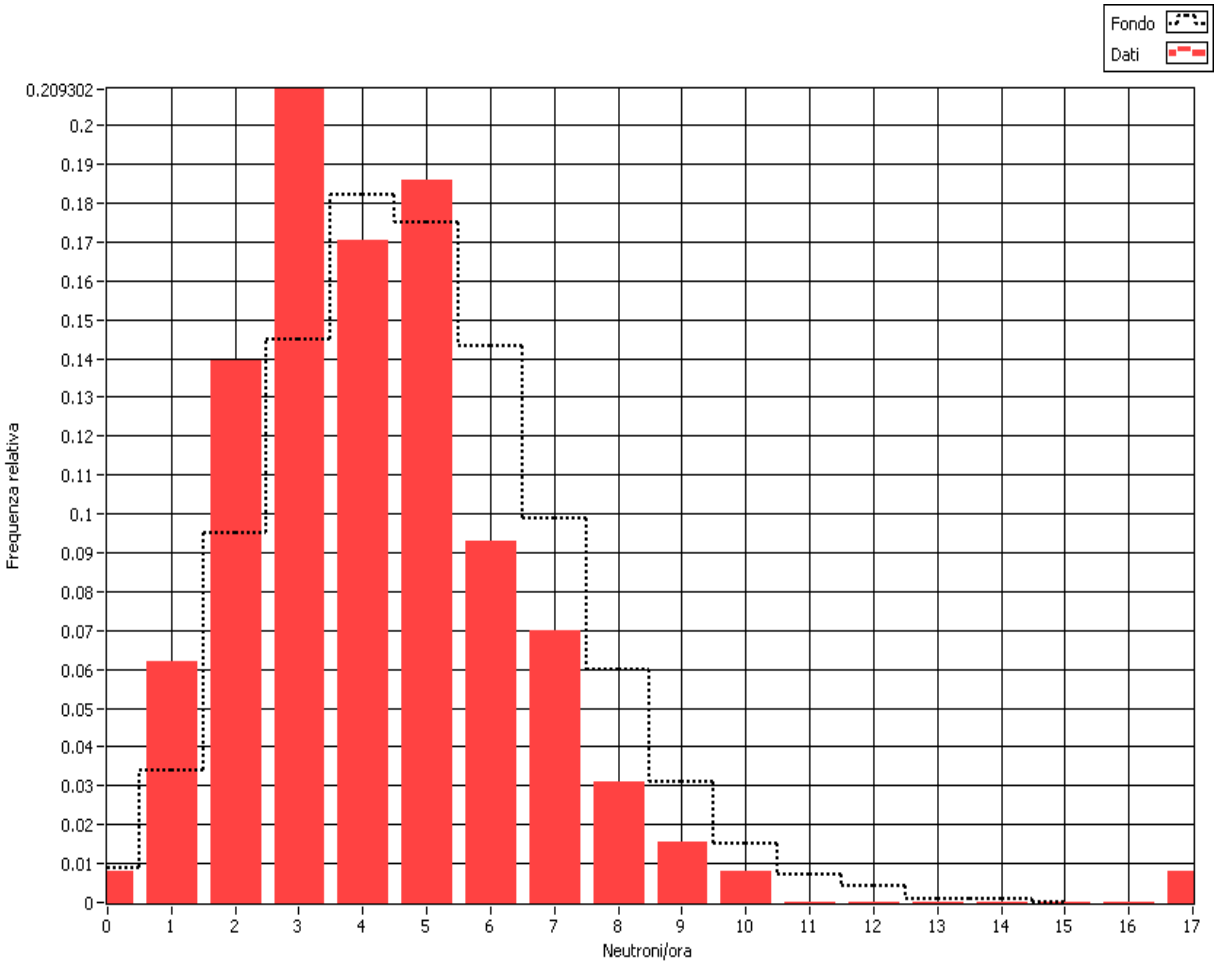
Neutron recording



Neutron emission during H_2 loading in Pd thin layer statistical analysis

	Real data			Probabiliity extended up to 6 count per minute						
Case	0	1	2	0	1	2	3	4	5	6
n.	161	9	1	0,9415	0,0526	0,0058				
n.	1379	86	5	0,9380	0,0585	0,0034	0,0002	1,25E-05	7,51E-07	4,52E-08

Neutron emission during H_2 loading in Pd thin layer (dec 2014)



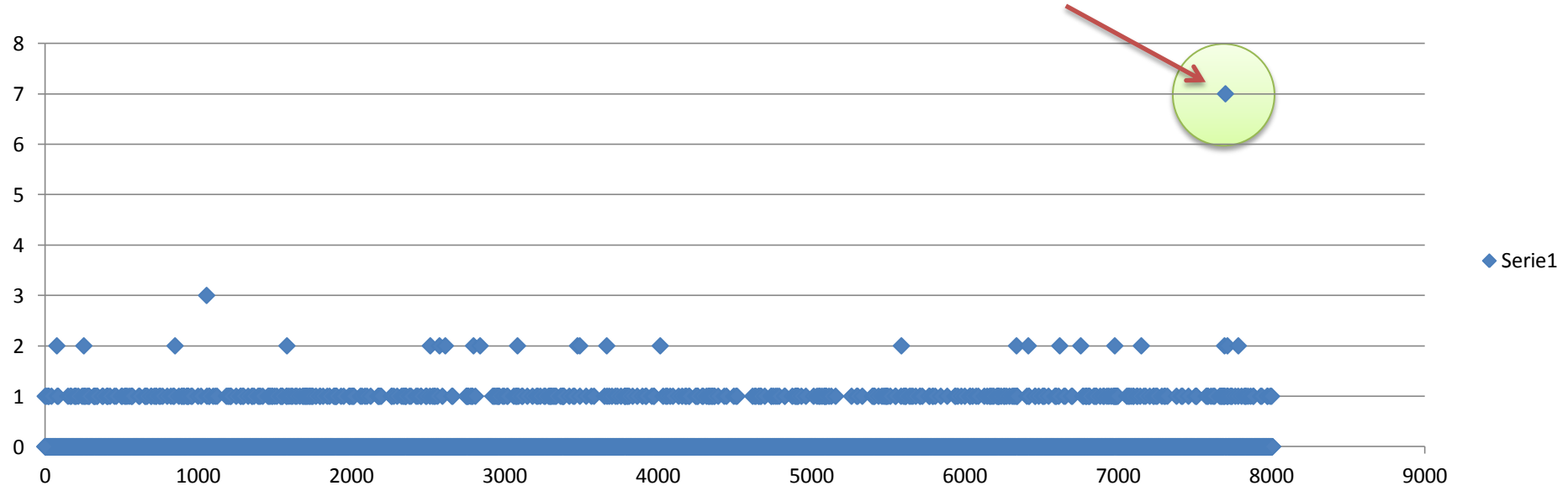
Neutron emission during H_2 loading in Pd thin layer statistical analysis

Neut/h	counts	Relative frequency	Gaussian Probability	Poissonian Probability
0	1	0,0078	0,0620	0,0162
1	8	0,0625	0,0967	0,0667
2	18	0,1406	0,1299	0,1375
3	27	0,2109	0,1507	0,1891
4	22	0,1719	0,1507	0,1950
5	24	0,1875	0,1299	0,1609
6	12	0,0938	0,0967	0,1106
7	9	0,0703	0,0620	0,0652
8	4	0,0313	0,0343	0,0336
9	2	0,0156	0,0164	0,0154
10	1	0,0078	0,0067	0,0064
17	1		2,147E-07	1,31727E-06

Reference table fitting an example of recorded data matching background.

Dec 2014 data reconstruction probability 2,8 x 10^{-9}

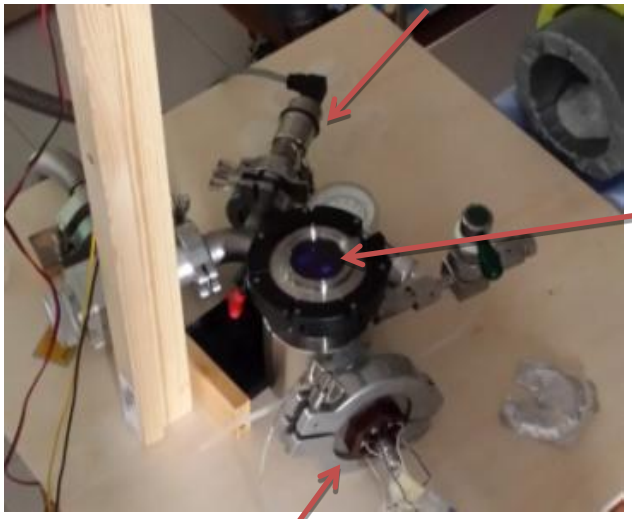
Anomalous neutron burst in coincidence with Pd thin film Hydrogen loading



Dec. 2016

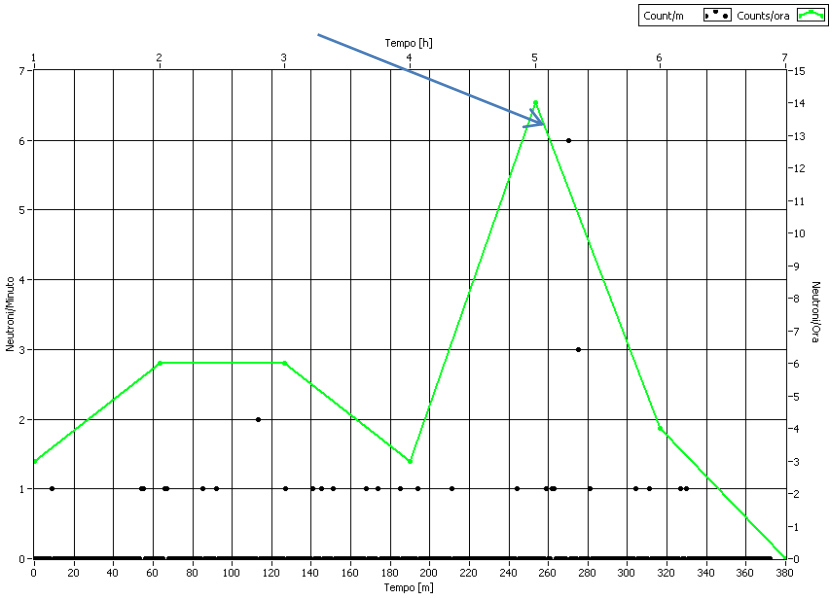
Anomalous neutron burst in coincidence with Pd thin film Hydrogen loading

Pressure sensor

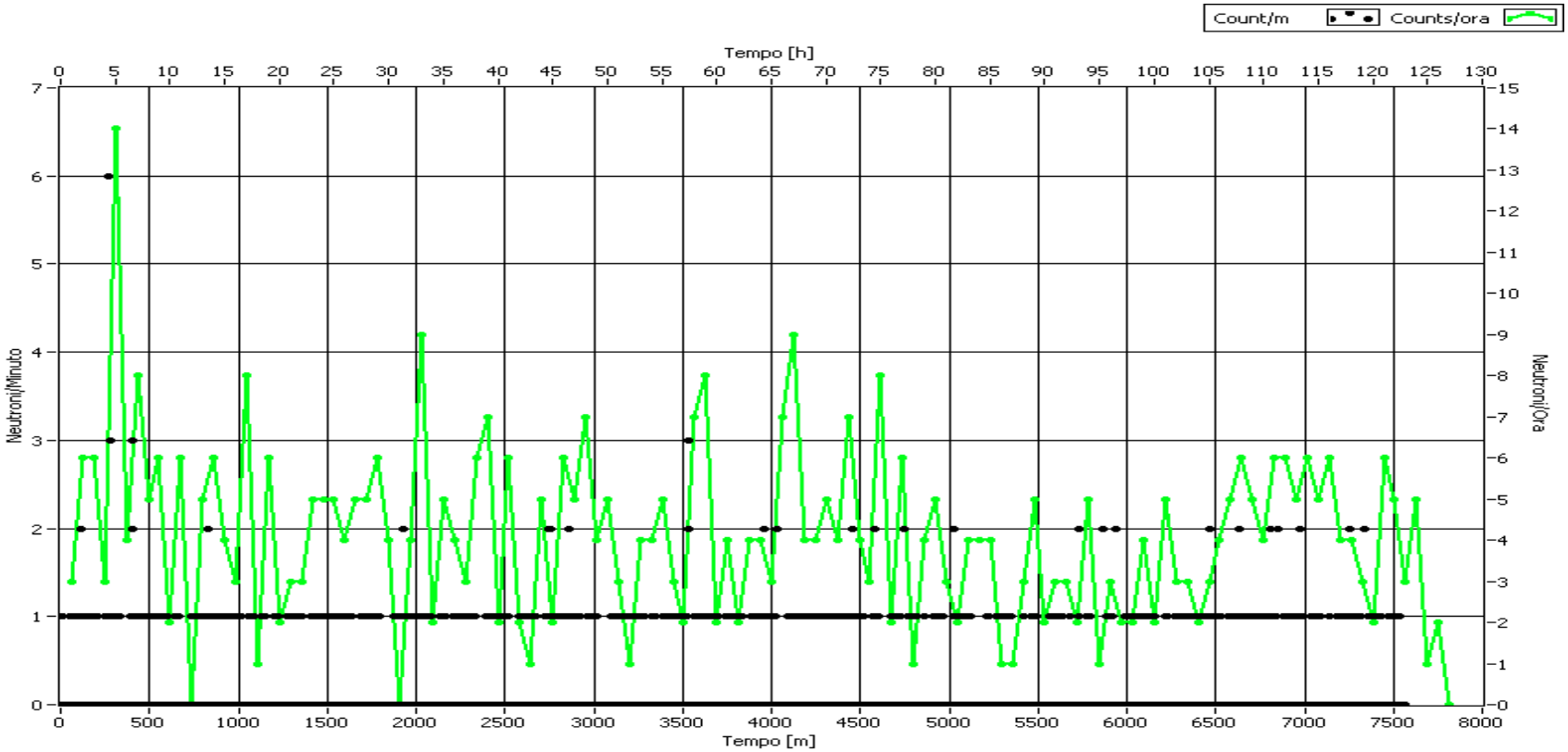


Codial Viewport

Electrical feedthroughs

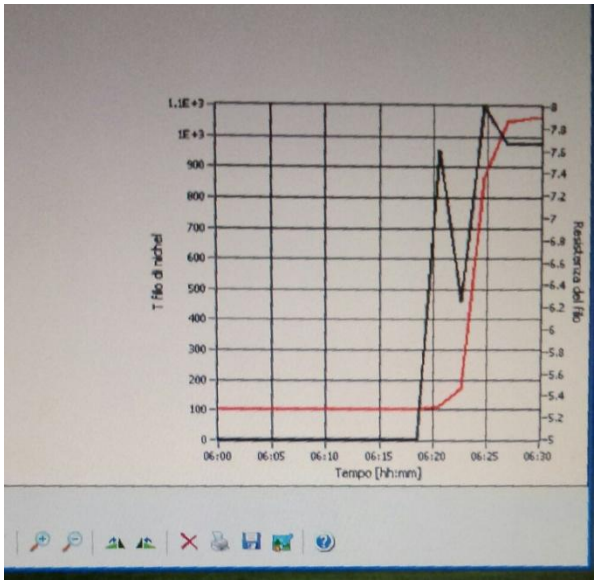


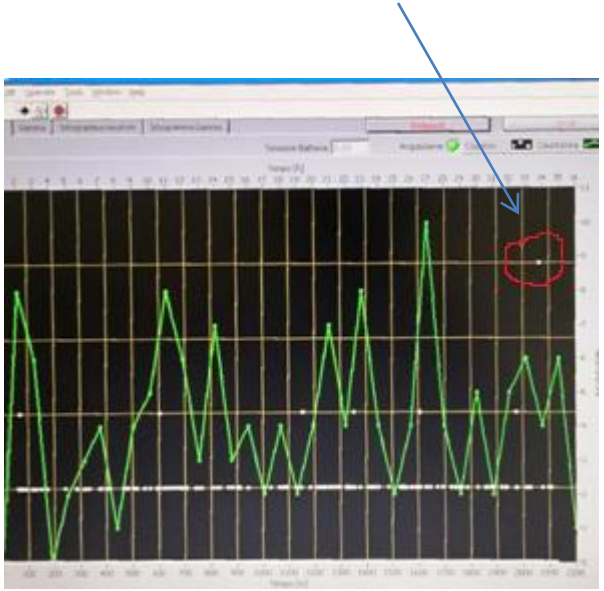
Neutron emission during H_2 loading in Pd thin layer (12, 2016)



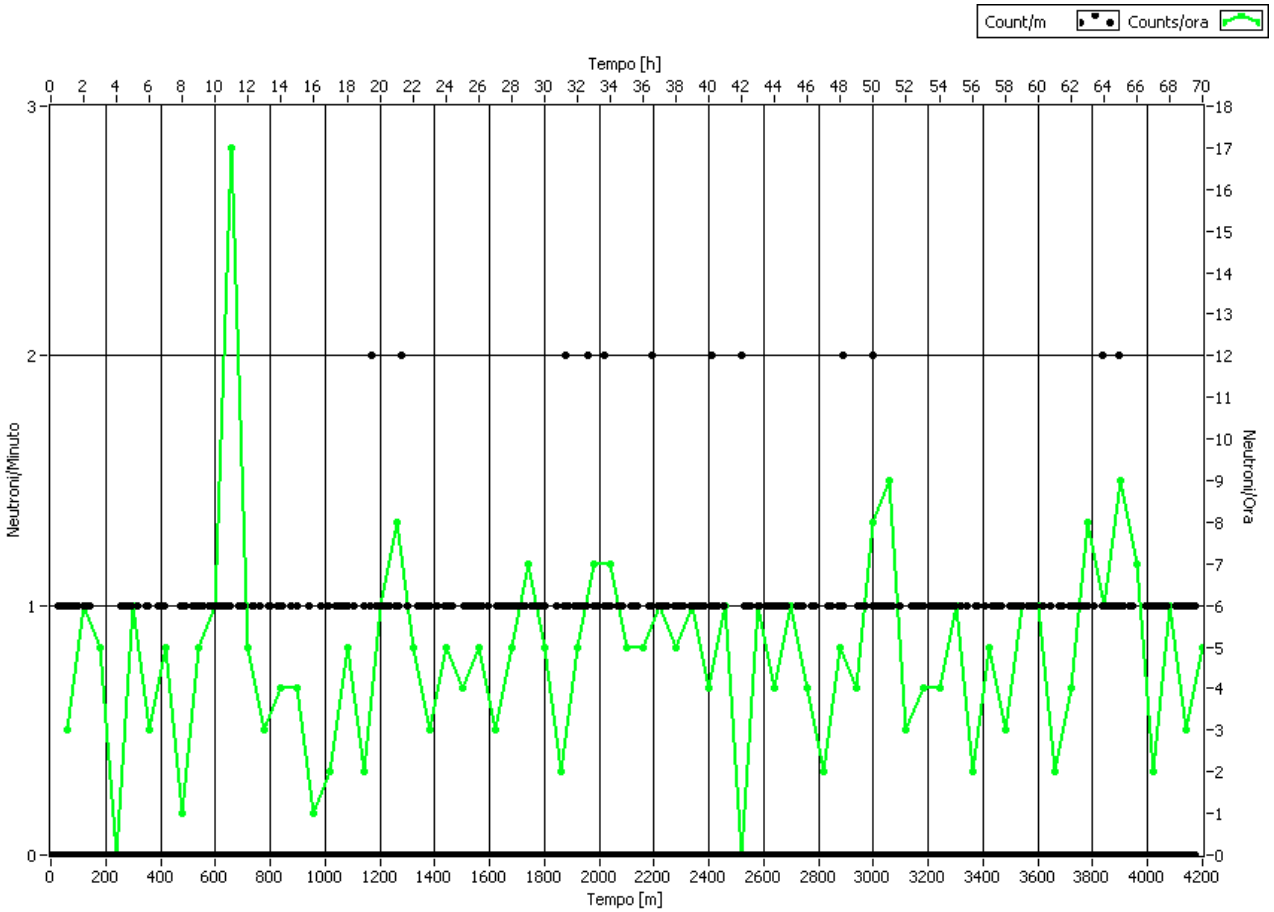
5-14-2018 neutron burst: event probability 1.25×10^{-5}

Anomalous neutron burst in coincidence with Pd thin film Hydrogen loading

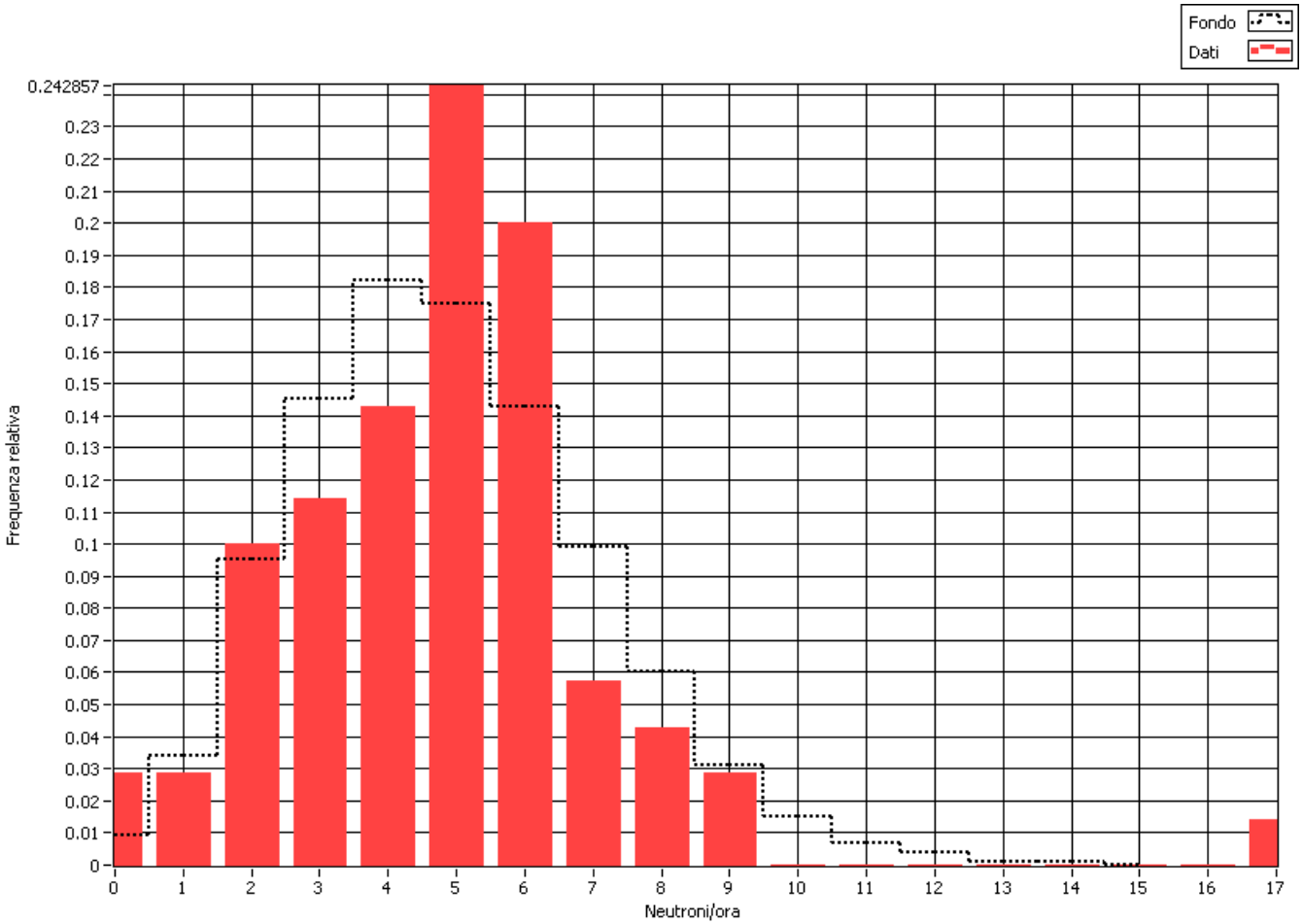




Third loading of Palladium plated Nickel sample neutron data trend (9-22-2018)



Third loading of Palladium plated Nickel sample neutron data histogram (9-22-2018)



Experimental setup view

Sample in place

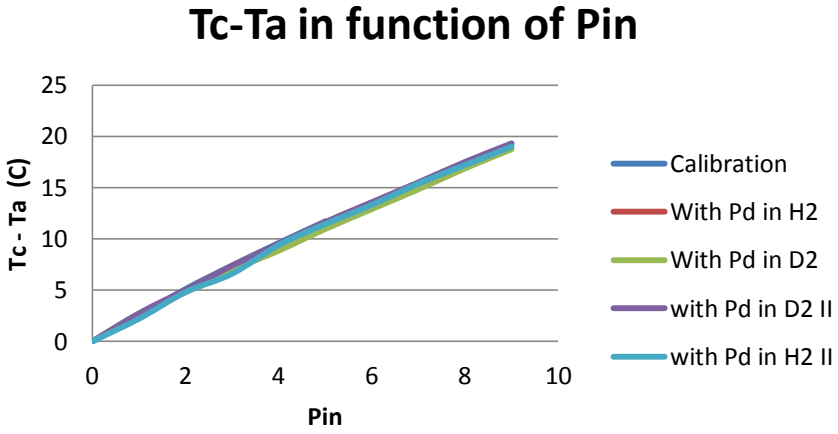
Deuterium loading setup

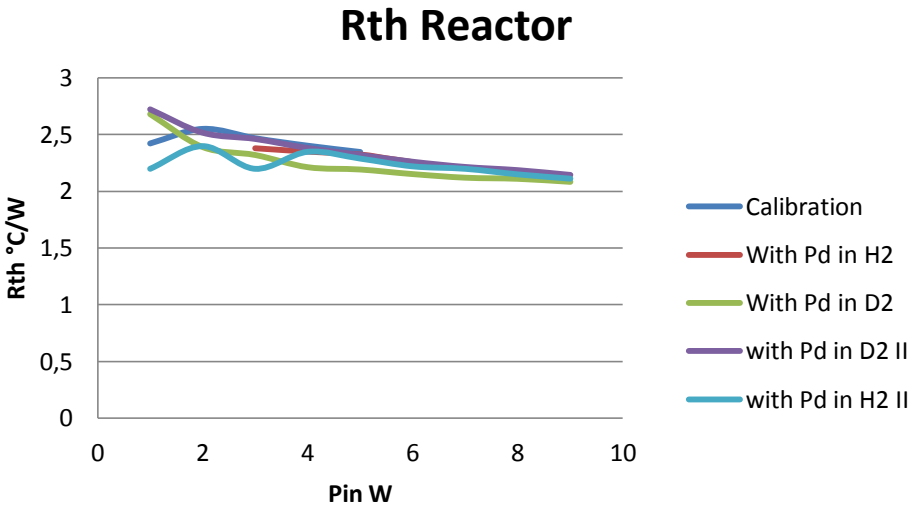
Experimental data example

Power W	T heater °C	Tc Reactor °C	Ta ambient °C	Pressure P/Po	Tc – Ta °C	Rth C/W	R heater Ohm
0	25		25	1	0		0,9
1	65	28	25,32	1,1	2,68	2,68	1,02
2	100,75	29,74	24,96	1,17	4,78	2,39	1,17
3	137	31,5	24,54	1,24	6,96	2,32	1,34
4	174,75	33,29	24,44	1,3	8,85	2,21	1,49
5	206,6	35,24	24,28	1,37	10,96	2,19	1,67
6	240,45	37,08	24,17	1,43	12,91	2,15	1,85
7	270	38,96	24,12	1,5	14,84	2,12	2,03
8	301	40,7	23,82	1,61	16,88	2,11	2,23
9	329,5	42,49	23,74	1,7	18,75	2,08	2,42

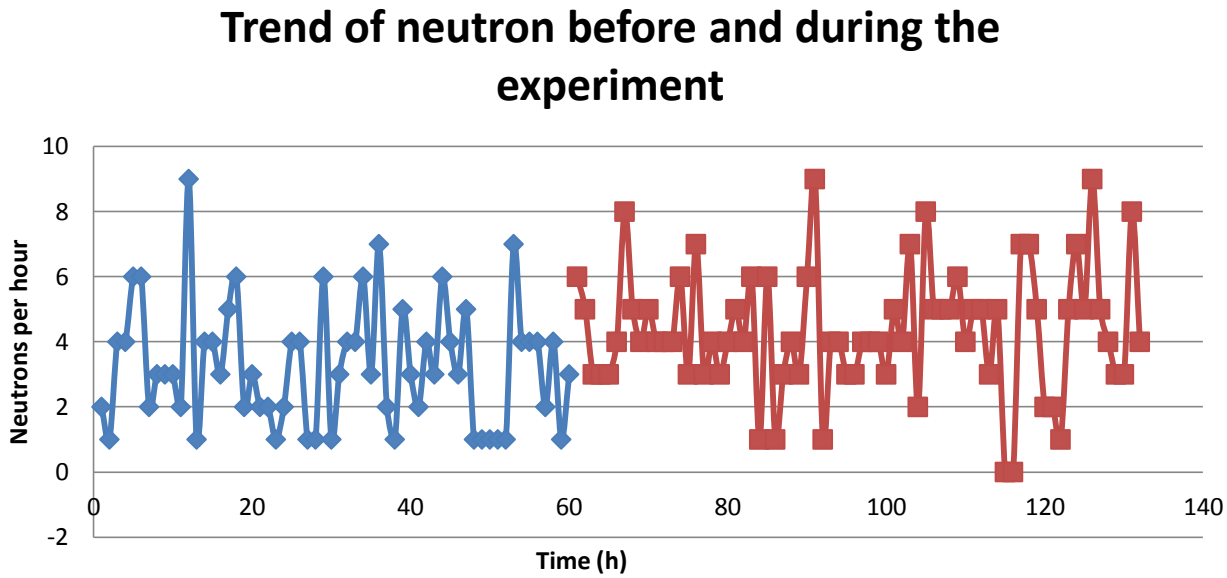
Table relating to the test with the material covered with palladium in deuterium

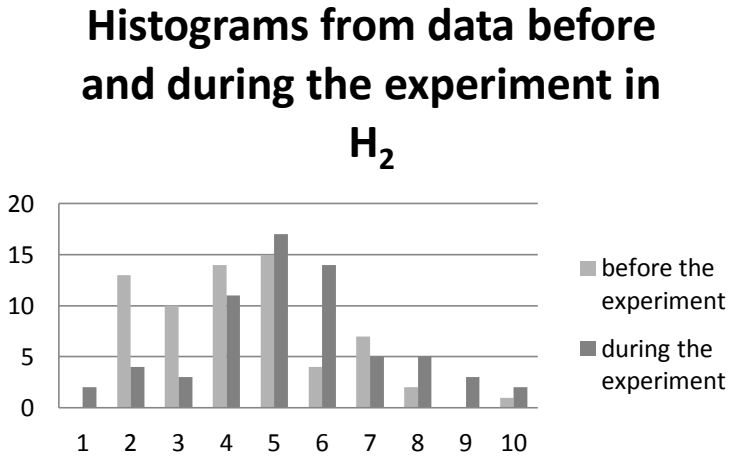
Extra heat verification



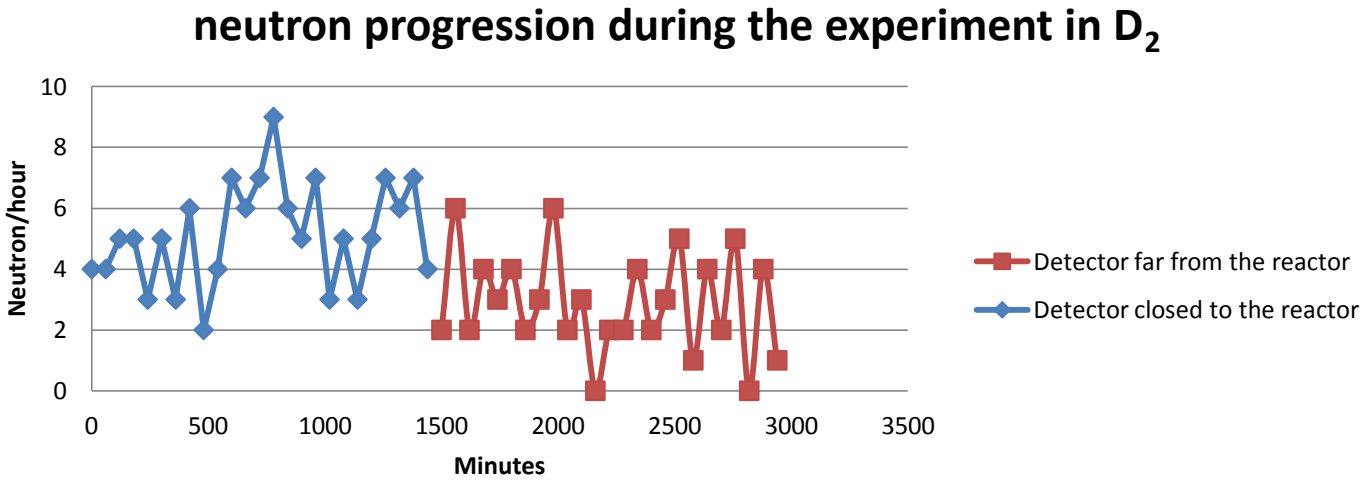


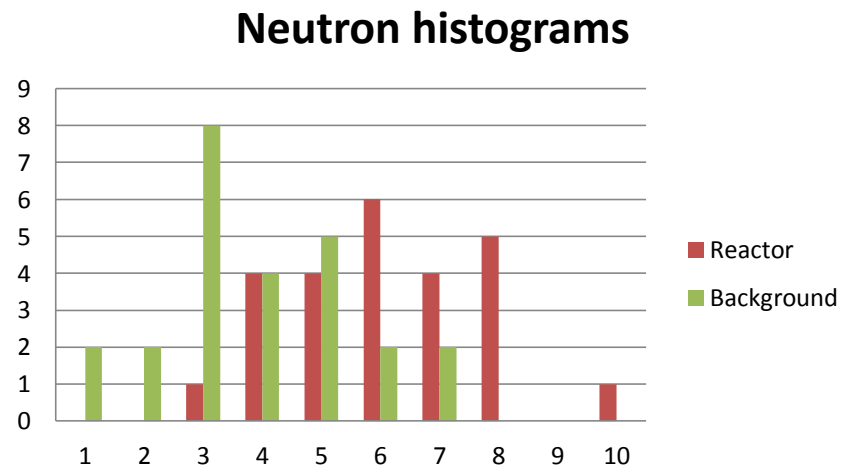
Pd on Ni in H_2


Trend of neutron before and during the experiment
Neutrons per hour
10
8
6
4
2
0
-2
0
20
40
60
80
100
120
140
Time (h)

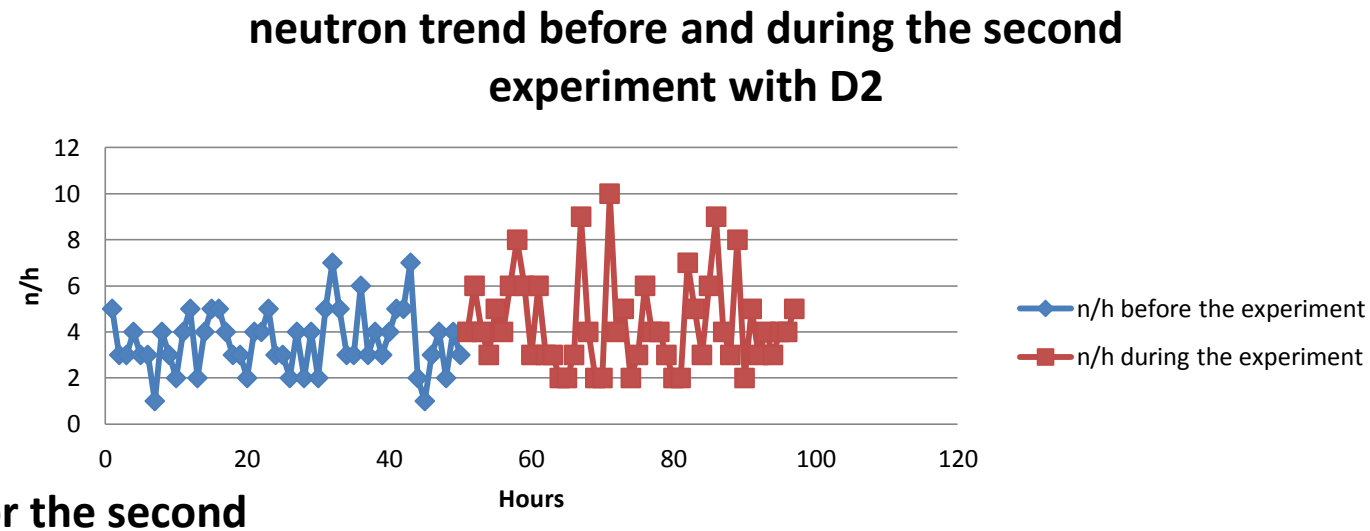

Histograms from data before and during the experiment in H_2
20
15
10
5
0
1
2
3
4
5
6
7
8
9
10
before the experiment
during the experiment

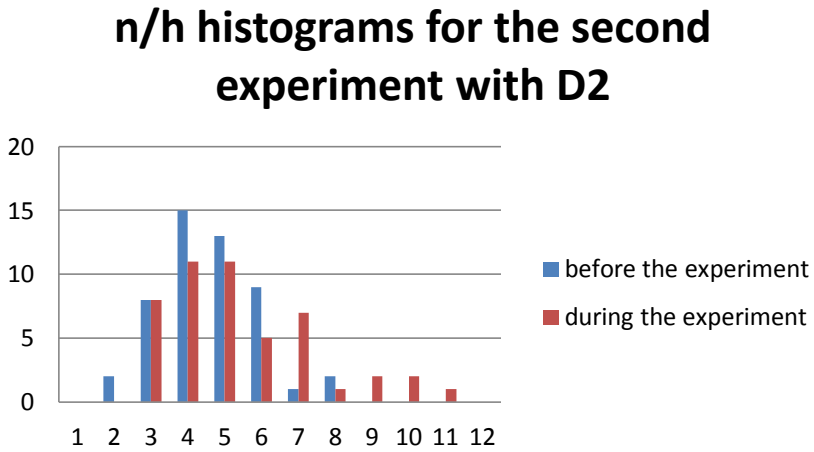
Pd on Ni in D_2


neutron progression during the experiment in D2
Neutron/hour
Minutes
0
2
4
6
8
10
0
500
1000
1500
2000
2500
3000
3500
Detector far from the reactor
Detector closed to the reactor


Neutron histograms
0
1
2
3
4
5
6
7
8
9
1
2
3
4
5
6
7
8
9
10
Reactor
Background

Pd on Ni in D2 second sample





Solid state laser induced strong neutron anomaly

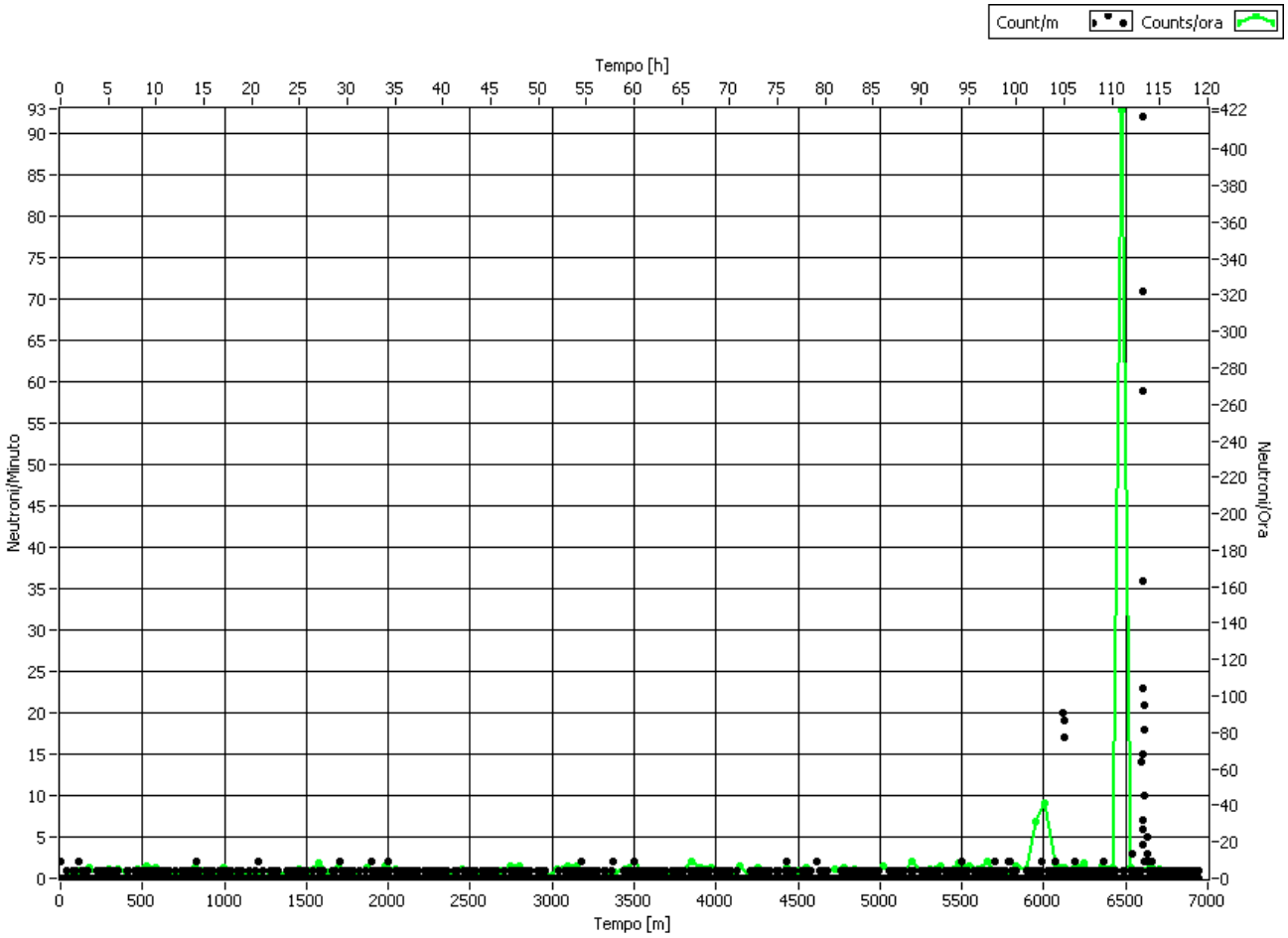
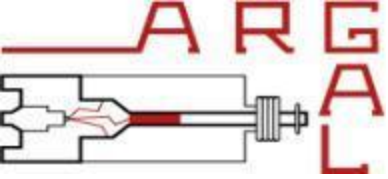


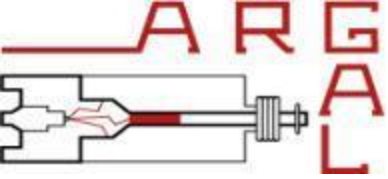
Chart extracted on October 18th 2014 at 5 past 4 PM.
The first peak is about 12 hours before and the second peak 5/6 hours before.
The duration of the first peak (black points) is about 3 minutes, while the second, much more intense, lasted about 17 minutes.
The green line indicates the neutron average in an hour, blackheads neutrons every minute.

U. Mastromatteo, Greccio, 5-9 October 2018



Conclusions

- Abnormal neutron emissions from reactor 1 at the Bareggio ARGAL laboratory were detected several times. Unfortunately in the most noticeable cases, we do not have a convincing explanation on the mechanism that had produced them. Even meticulous attempts to replicate the conditions that originally appeared suitable have produced no breakthrough. The current analysis of abnormal emission during the loading of a thin layer of palladium is instead a repetition of an event already seen and reproduced in identical conditions, for which reason it is believed that such events are not random and so the overall experimental outcome confirms that the interaction between palladium and hydrogen is actually the location where nuclear abnormalities of LENR type occur.



Thank you for the attention