Slow Control PMT rates

Period: 26/04/2013 → 16/06/2013

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LNS-INFN

Outline

- Use of Slow Control rates to extract baselines, burst fractions for the estimation of the ^{40}K contribution and bioluminescence.
- Comparison of Slow Control rates with Post-Trigger rates to test the reliability of Slow Control data analysis.

- Baseline and burst fraction 1h, 24 h and 15 min step.
- Comparison with Antares data.
- Correlation of burst trends with Compass behavior.

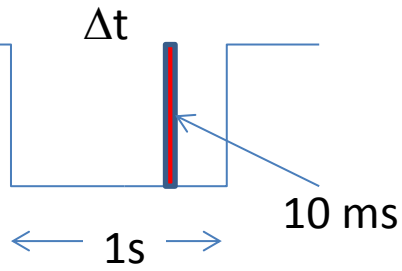
COMPARISON WITH RANDOM POST-TRIGGER

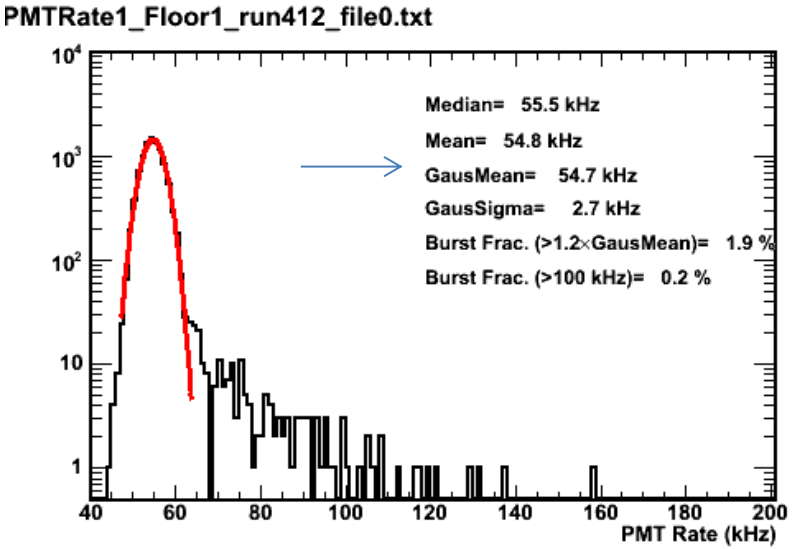
We are comparing **Slow Control** rates with those coming from **Post-Trigger (Biagi-Chiarusi)**.
We are analysing the data in the same period:

Run 412 file 0

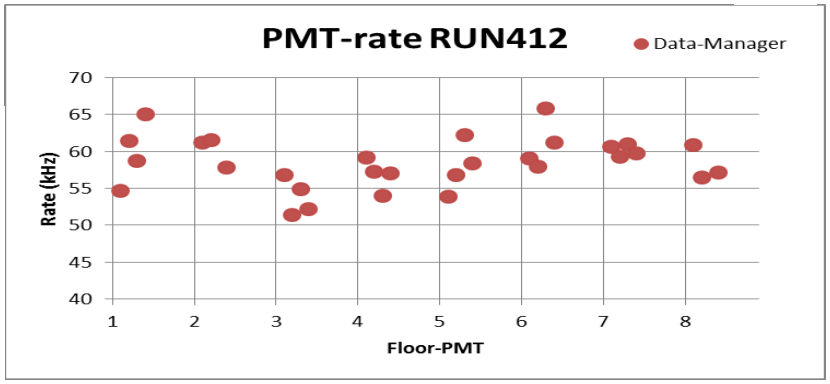
Start: 27/04/2013 01:34:28
Stop: 27/04/2013 04:17:19

Data are sampled once per second, and the rates is measured in a time window Δt=10ms.

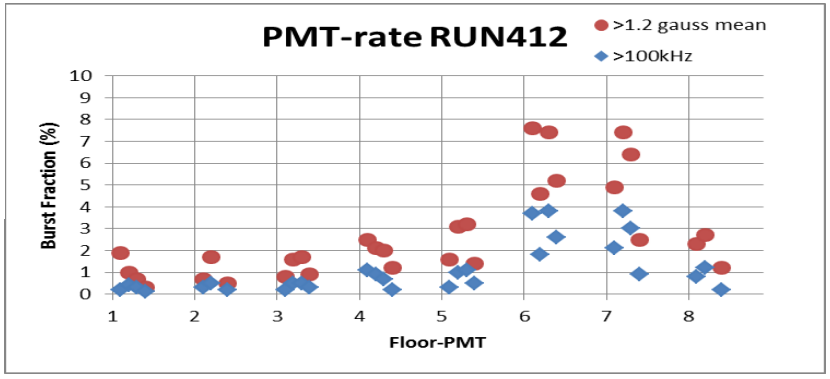




Analysis performed by using TestSite Code @C.Distefano

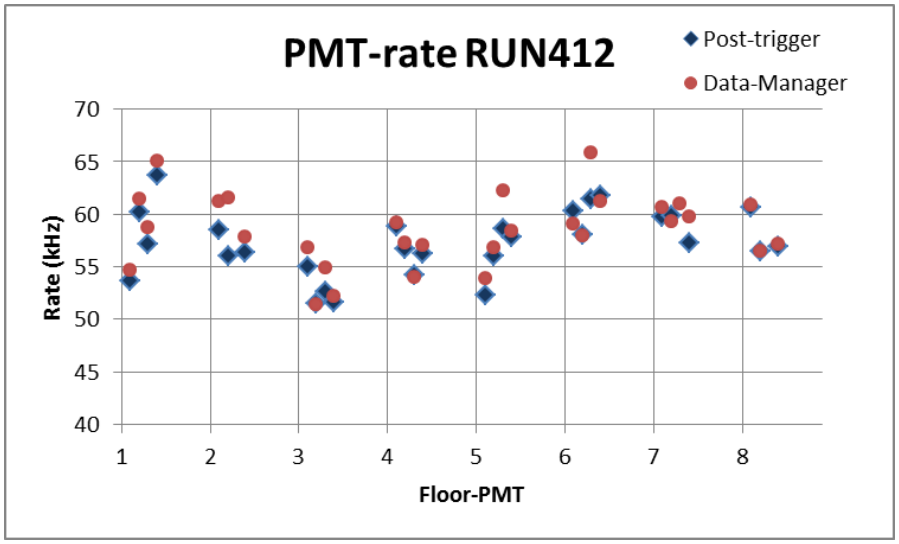


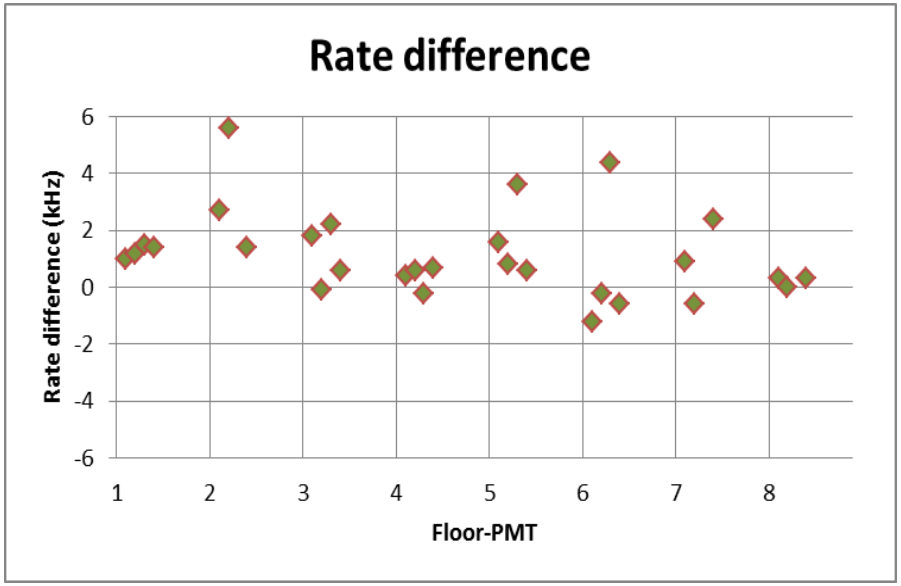
→Gaussian mean rate values= 50÷65 kHz



→Increase of the B.F. with floor number up to the 6th floor

Differences between S.C. and TRIDAS





→ S.C. and Tridas rates values generally differ for less than 3kHz.

A further check should be performed for the cases in which the difference is of about 5 KHz.

→ Sigma values of gaussian fits range from 2,5 up to 5kHz (worst cases).

→ S.C. rates are systematically larger,
this is probably due to the after-pulse effects.

Open questions:

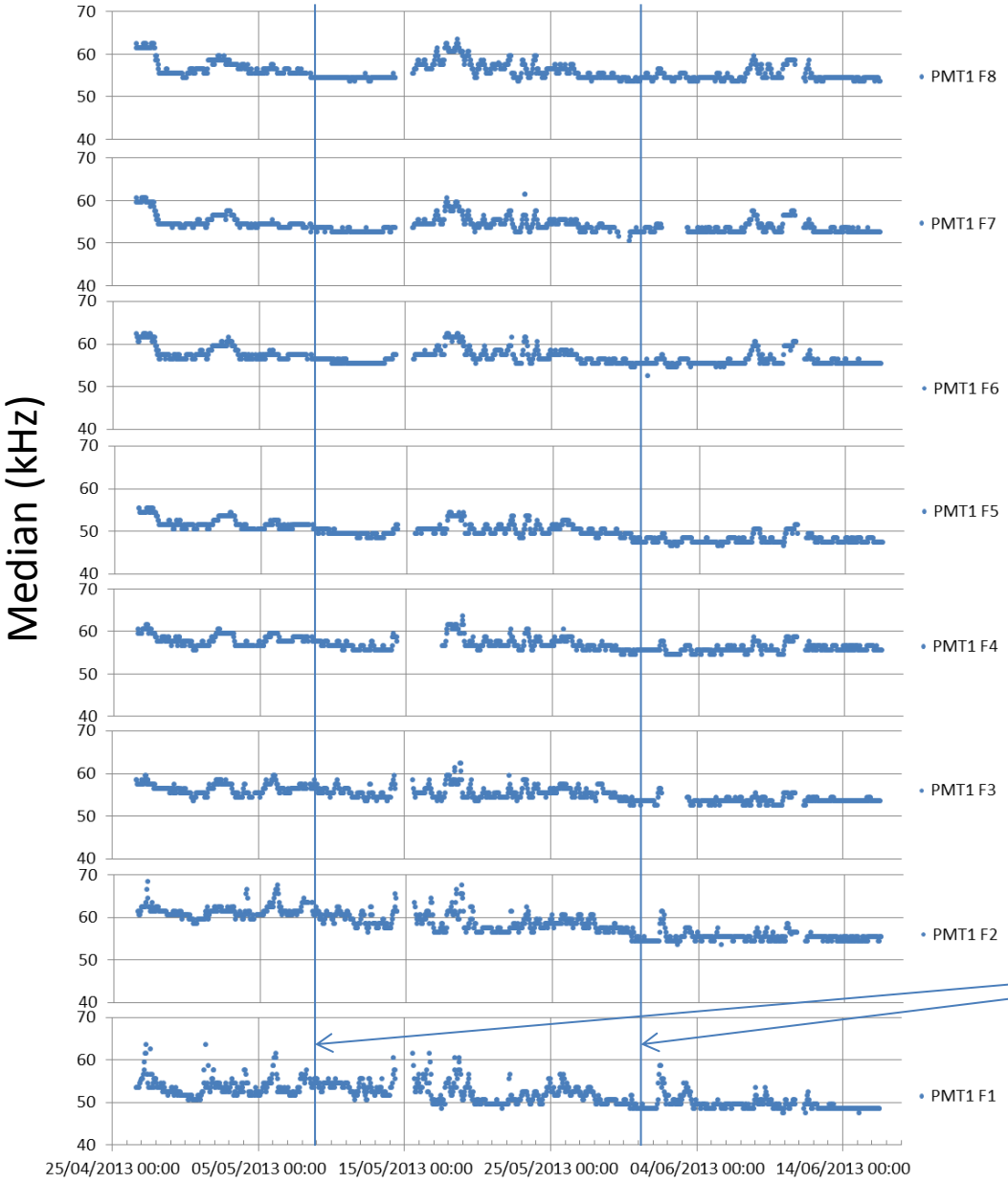
- Are the present differences changing from run to run?
- We need to better understand the causes of the systematic discrepancies.

Test needed to be performed:

- More systematic comparison: ex.: Compare more runs…
- Estimation of Burst Fraction from Post-Trigger files?

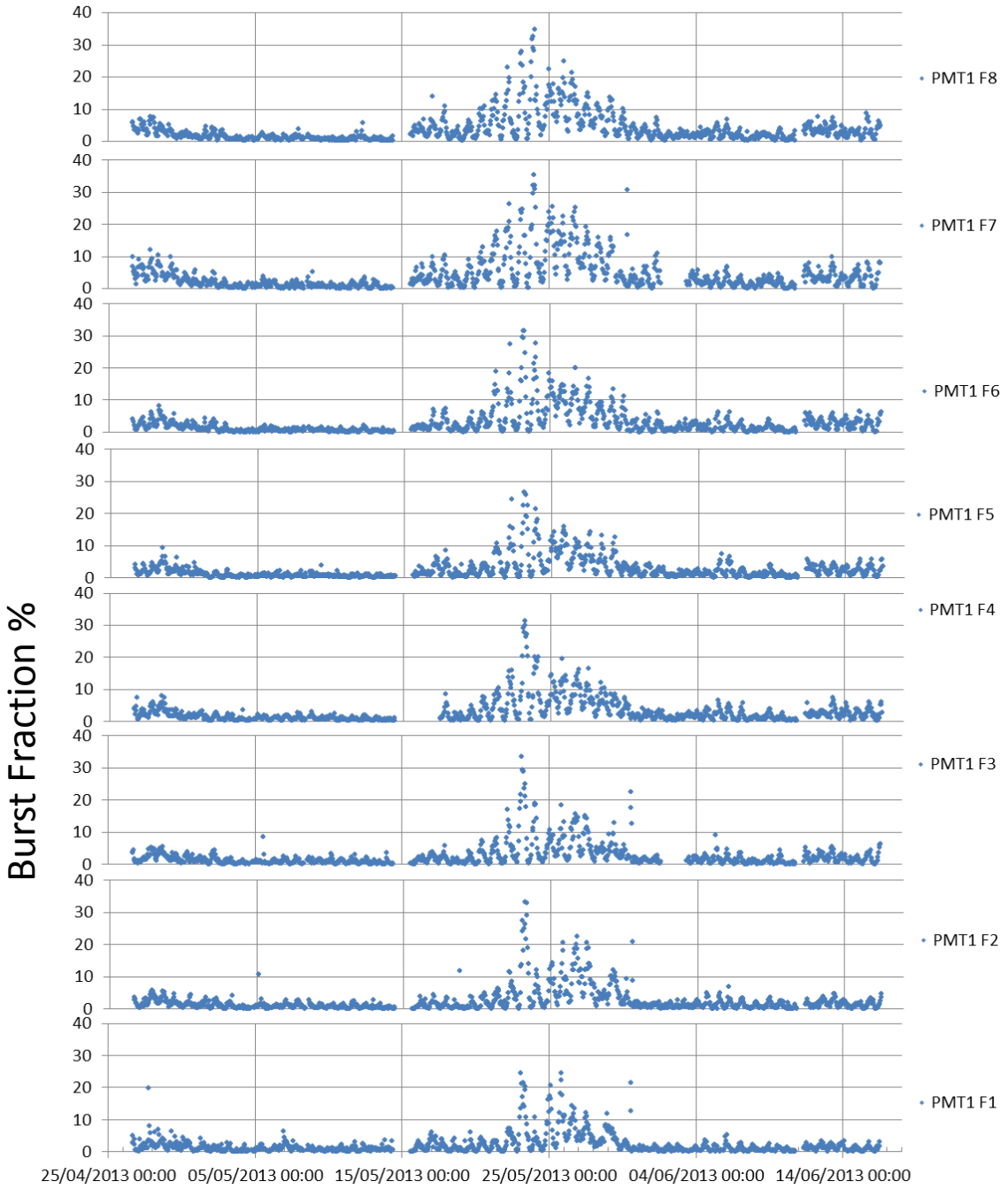
- Time window analysis with different time windows:
  - → 1h
  - →24h
  - →15 min for the comparison with Antares

1h- step window



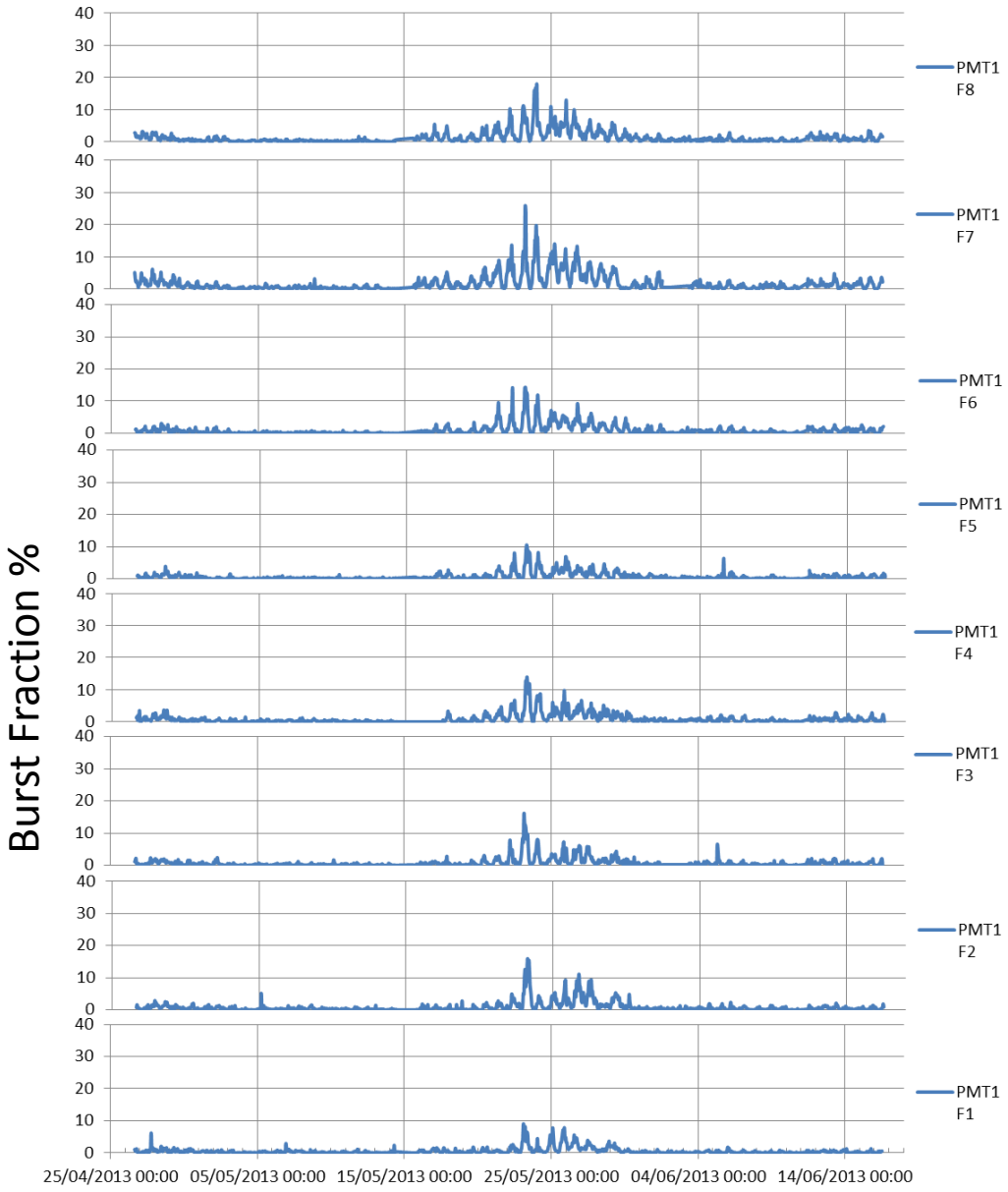
Behaviour of the baseline as a function of the floor.

Setting of the PMT HV



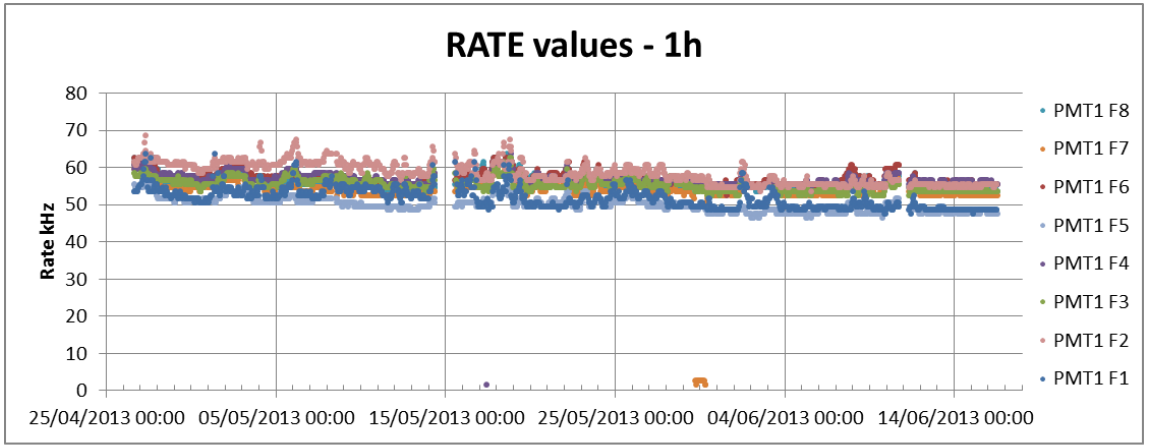
Behaviour of the **burst fraction** calculated as percentage of the events with rate > of 1.2*gaussian mean value.

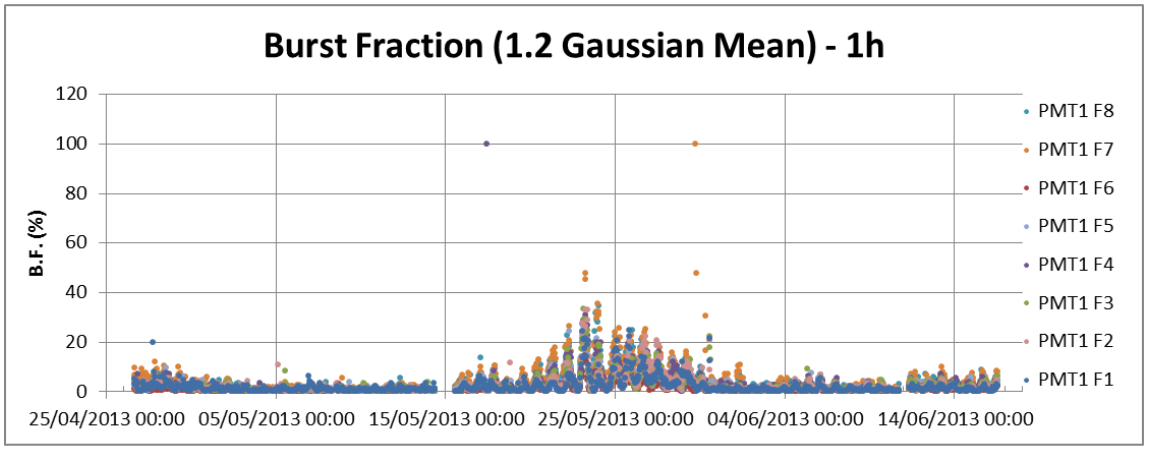
→ Rate is increasing with the Floor number.

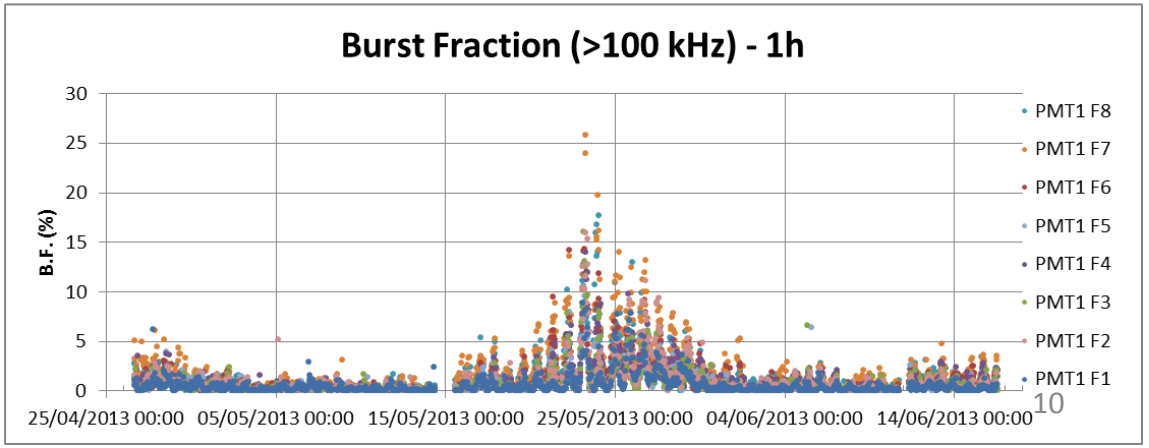


Behaviour of the **burst fraction** calculated as percentage of the events with rate > 100 kHz as a function of the floor.

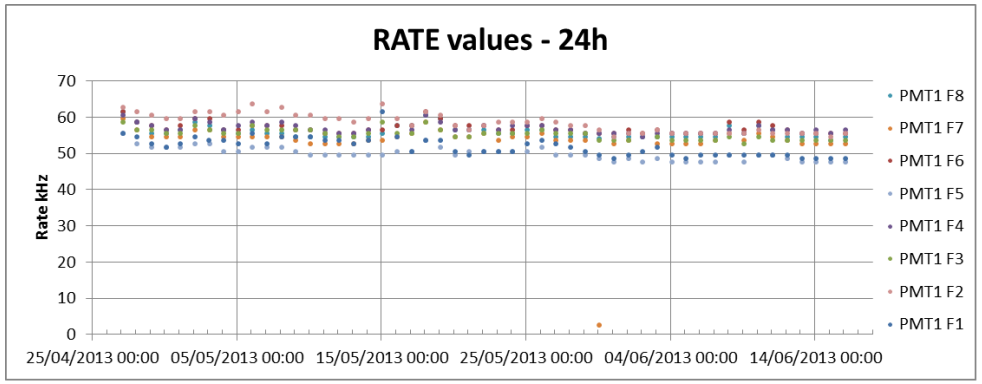
Global behavior of the baselines and burst fraction @ 1h step analysis.

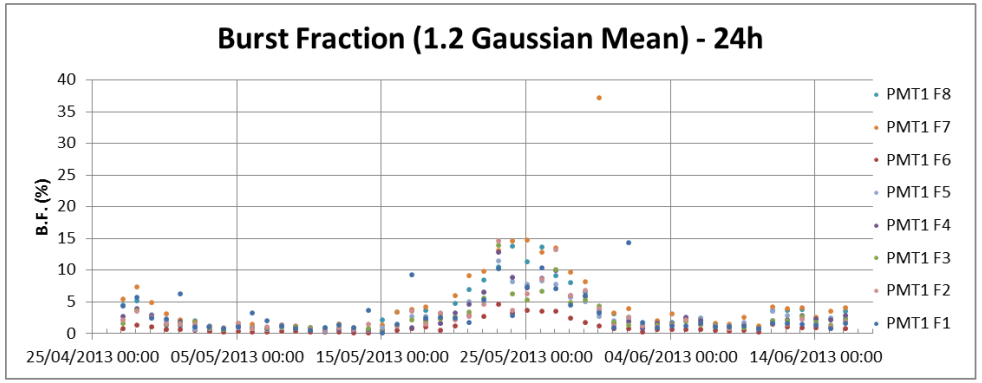


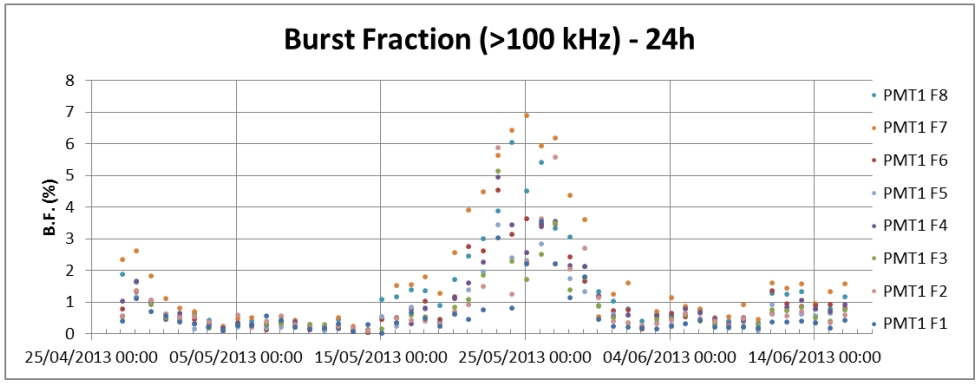




Global behavior of the baselines and burst fraction @ 24h step analysis.

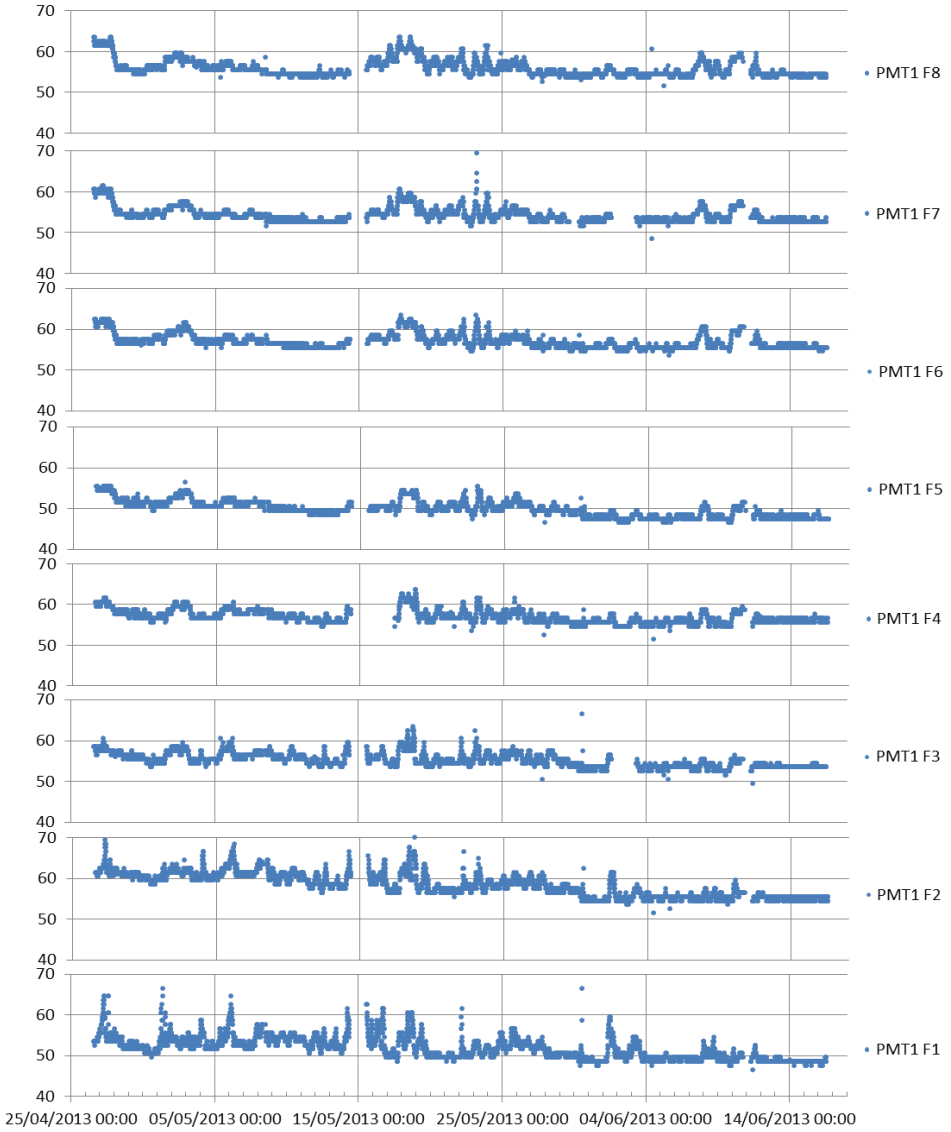




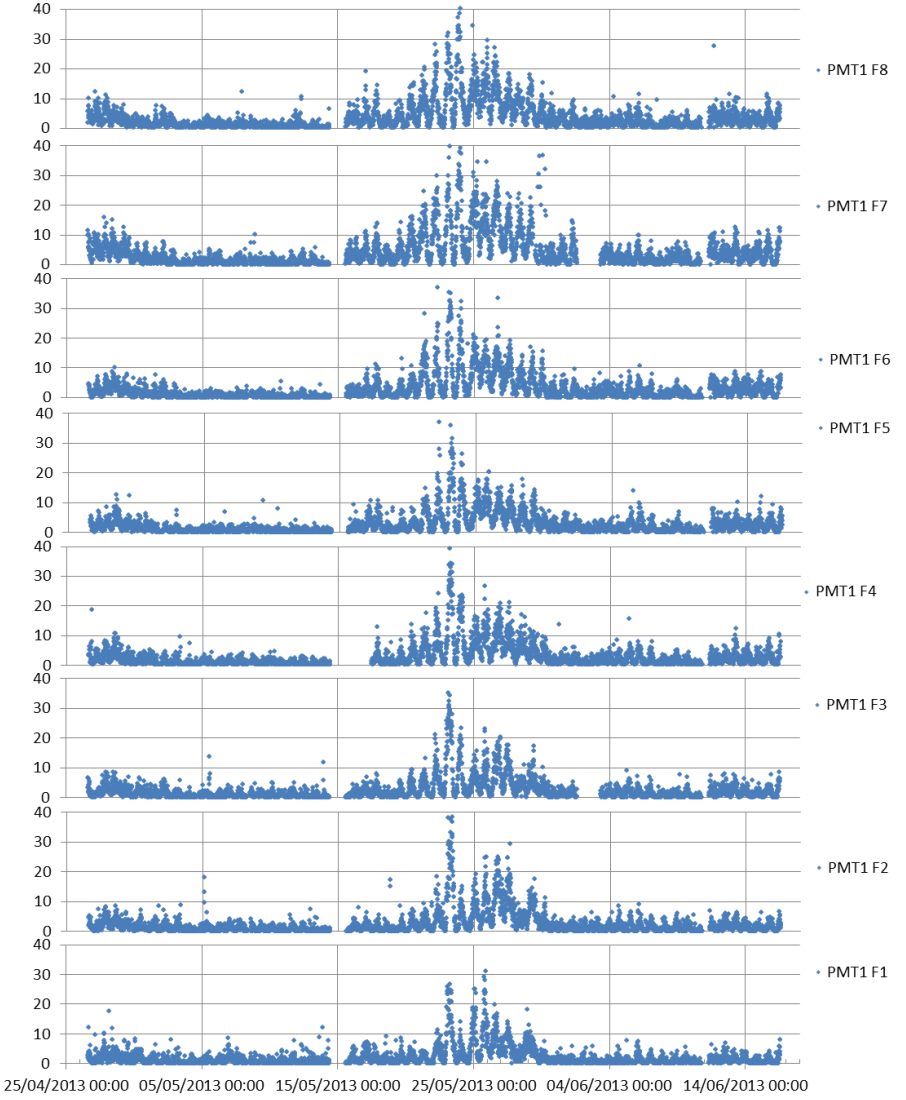


Step 15 min

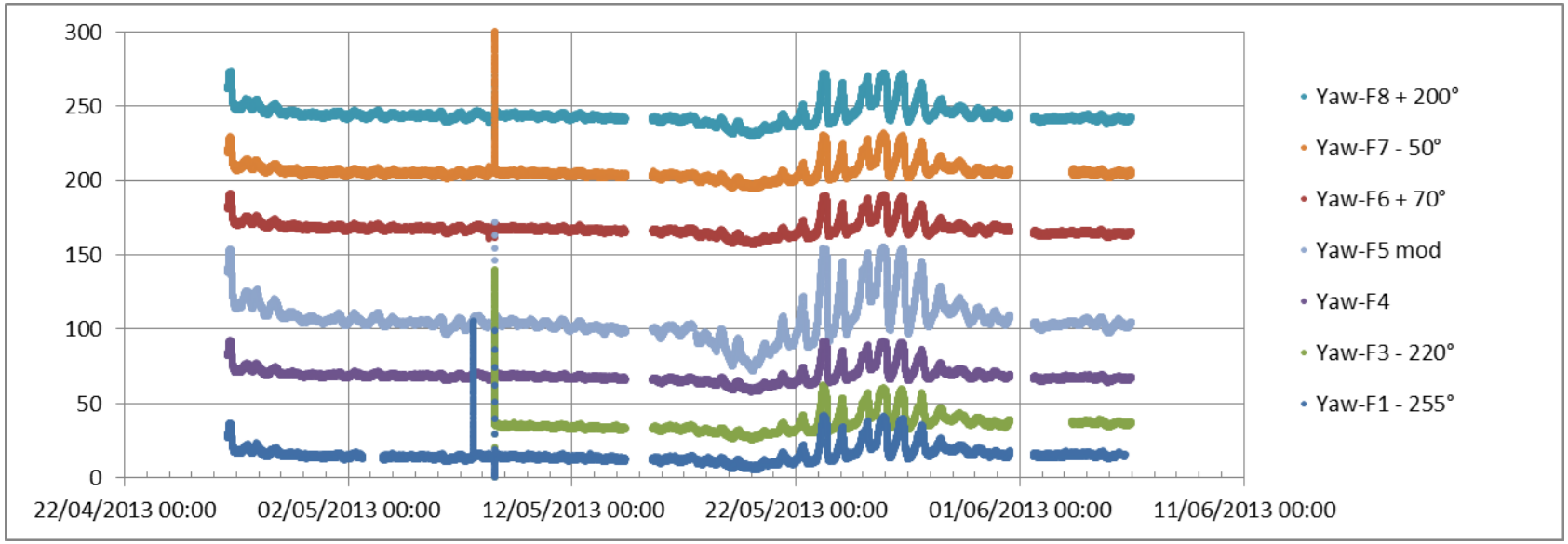
Median (kHz)



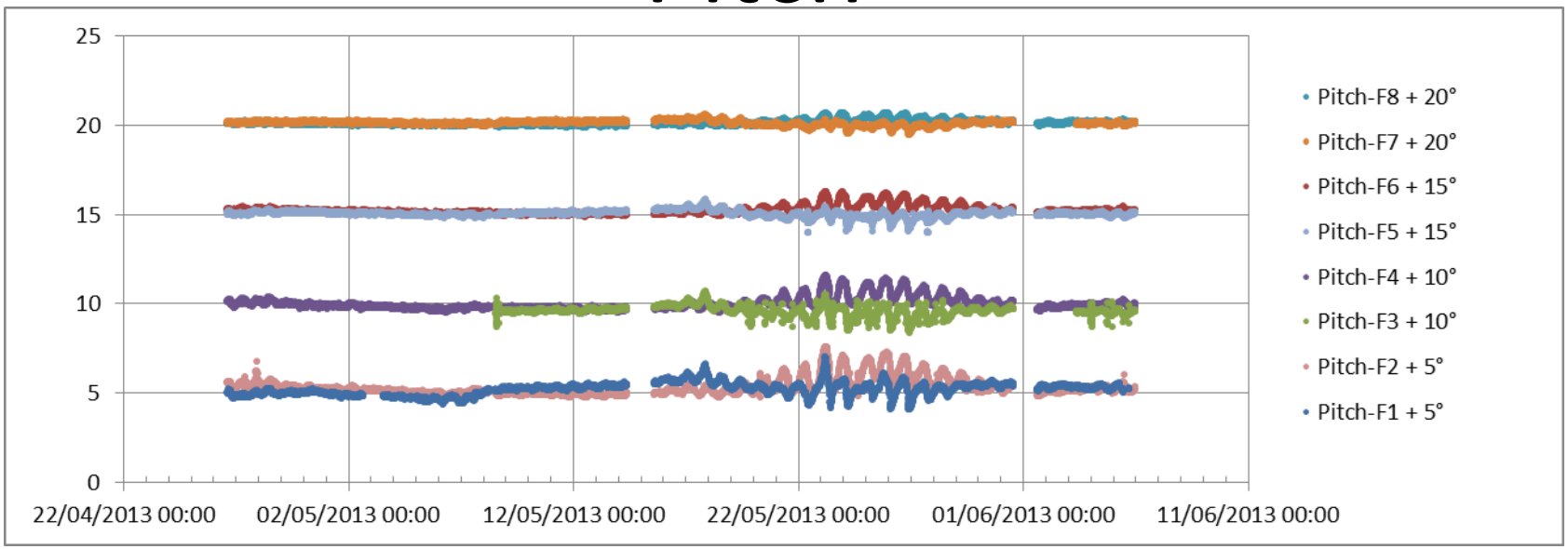
Burst – fraction (%)

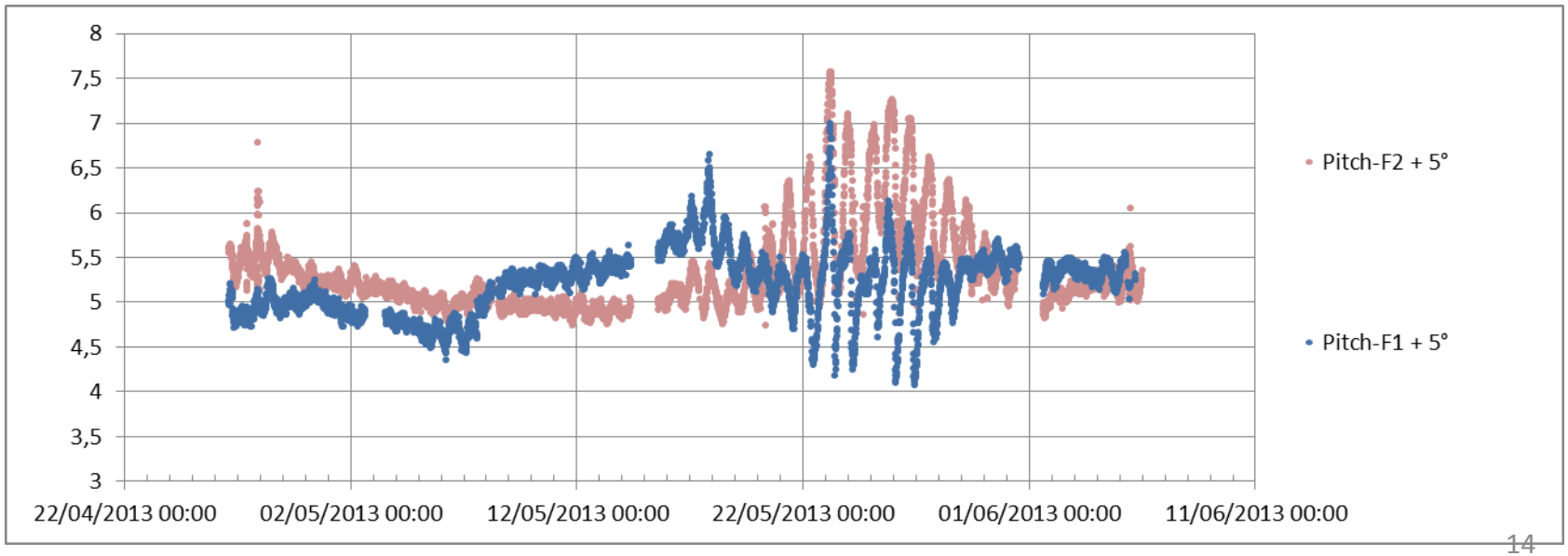


Yaw


300
250
200
150
100
50
0
22/04/2013 00:00
02/05/2013 00:00
12/05/2013 00:00
22/05/2013 00:00
01/06/2013 00:00
11/06/2013 00:00
Yaw-F8 + 200°
Yaw-F7 - 50°
Yaw-F6 + 70°
Yaw-F5 mod
Yaw-F4
Yaw-F3 - 220°
Yaw-F1 - 255°

Pitch


25
20
15
10
5
0
22/04/2013 00:00
02/05/2013 00:00
12/05/2013 00:00
22/05/2013 00:00
01/06/2013 00:00
11/06/2013 00:00
Pitch-F8 + 20°
Pitch-F7 + 20°
Pitch-F6 + 15°
Pitch-F5 + 15°
Pitch-F4 + 10°
Pitch-F3 + 10°
Pitch-F2 + 5°
Pitch-F1 + 5°


8
7,5
7
6,5
6
5,5
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4,5
4
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3
22/04/2013 00:00
02/05/2013 00:00
12/05/2013 00:00
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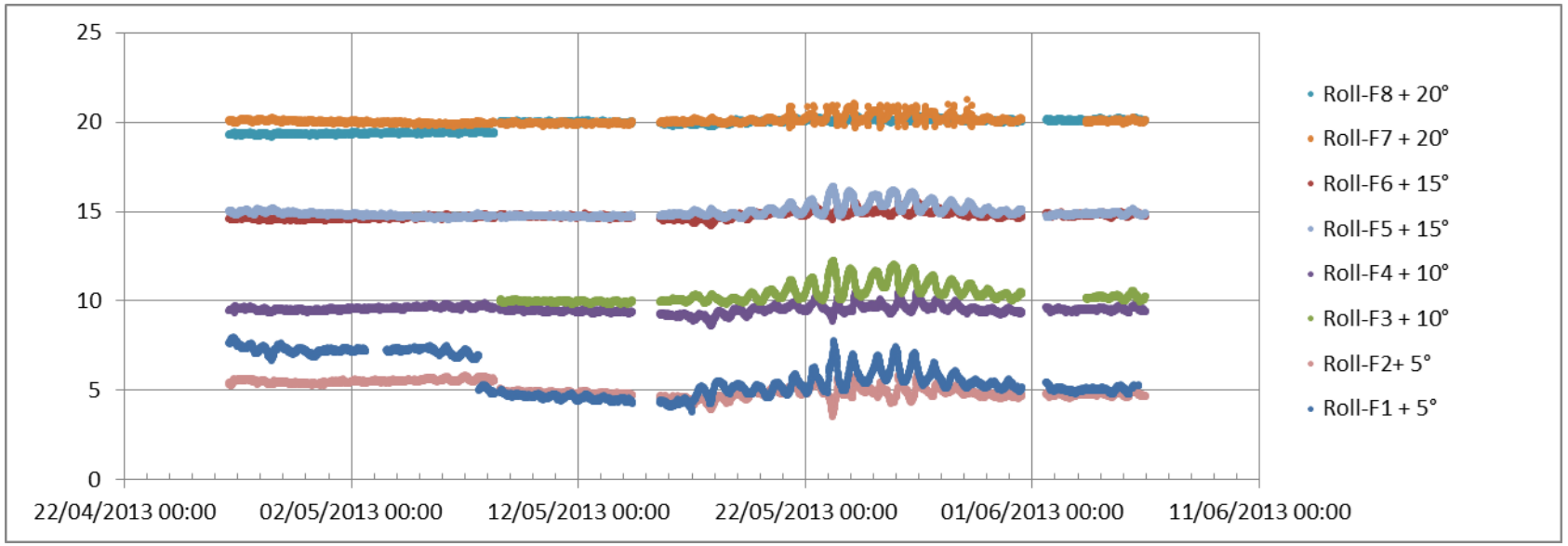
01/06/2013 00:00
11/06/2013 00:00
Pitch-F2 + 5°
Pitch-F1 + 5°

Roll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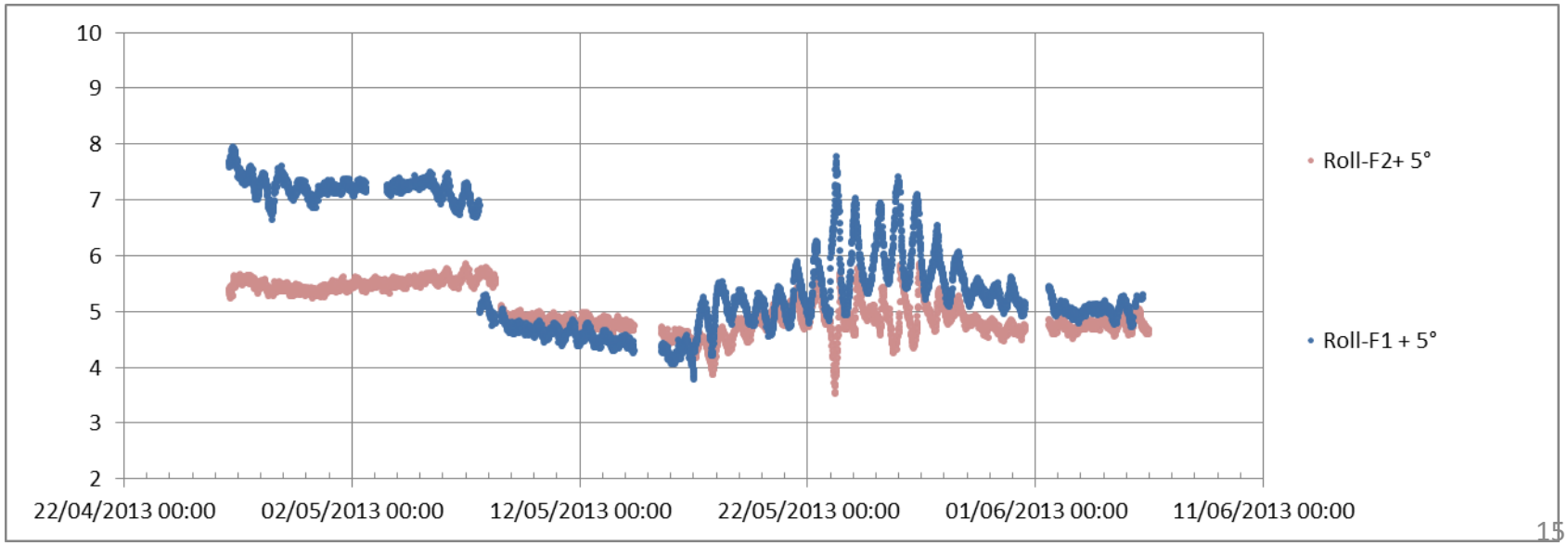
22/05/2013 00:00
01/06/2013 00:00
11/06/2013 00:00
Roll-F8 + 20°
Roll-F7 + 20°
Roll-F6 + 15°
Roll-F5 + 15°
Roll-F4 + 10°
Roll-F3 + 10°
Roll-F2+ 5°
Roll-F1 + 5°


10
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8
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4
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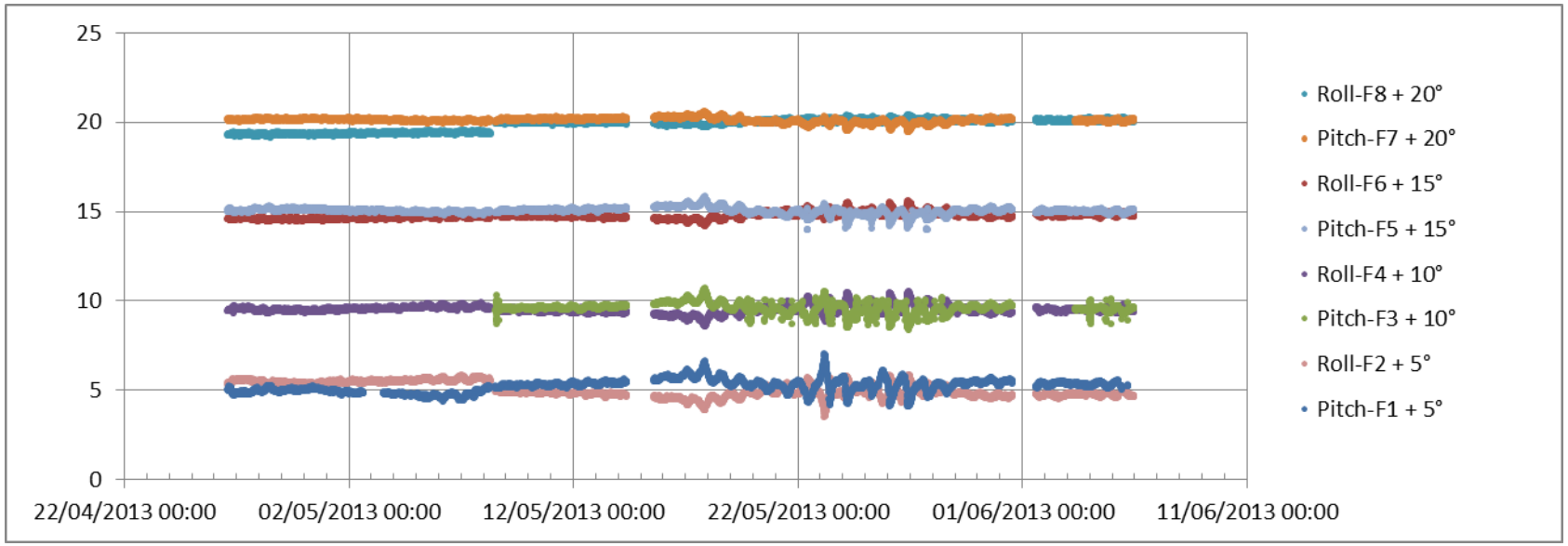
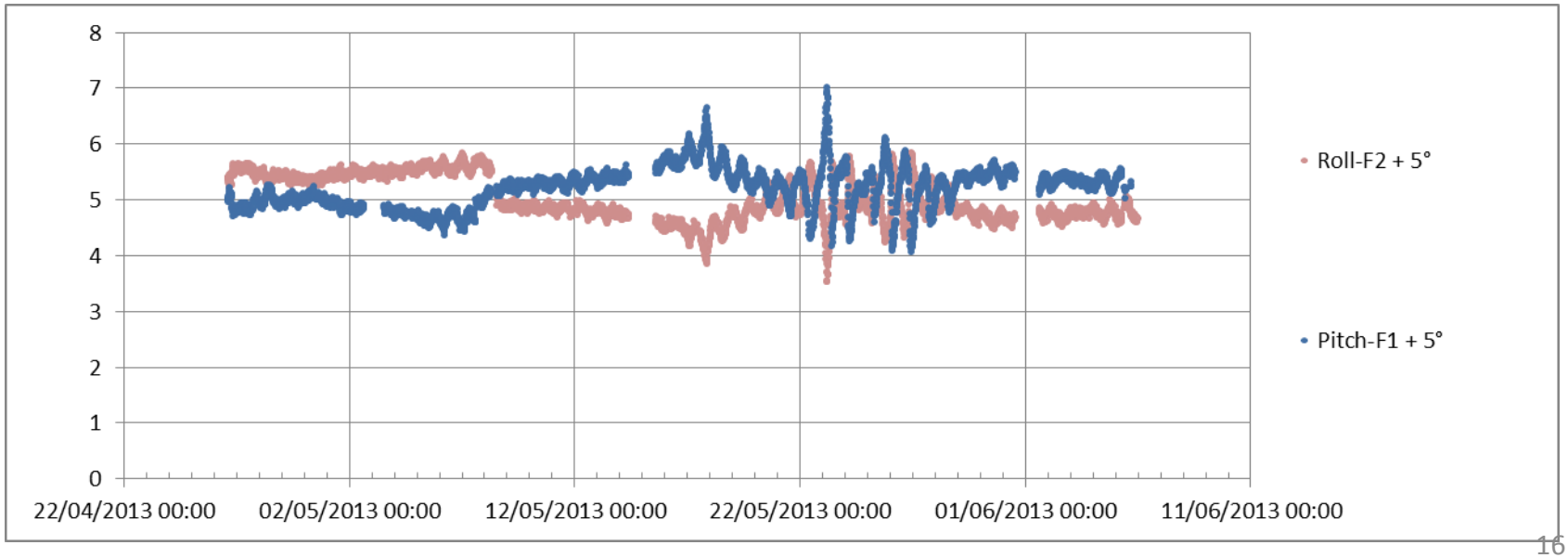
22/04/2013 00:00
02/05/2013 00:00
12/05/2013 00:00
22/05/2013 00:00
01/06/2013 00:00
11/06/2013 00:00
Roll-F2+ 5°
Roll-F1 + 5°

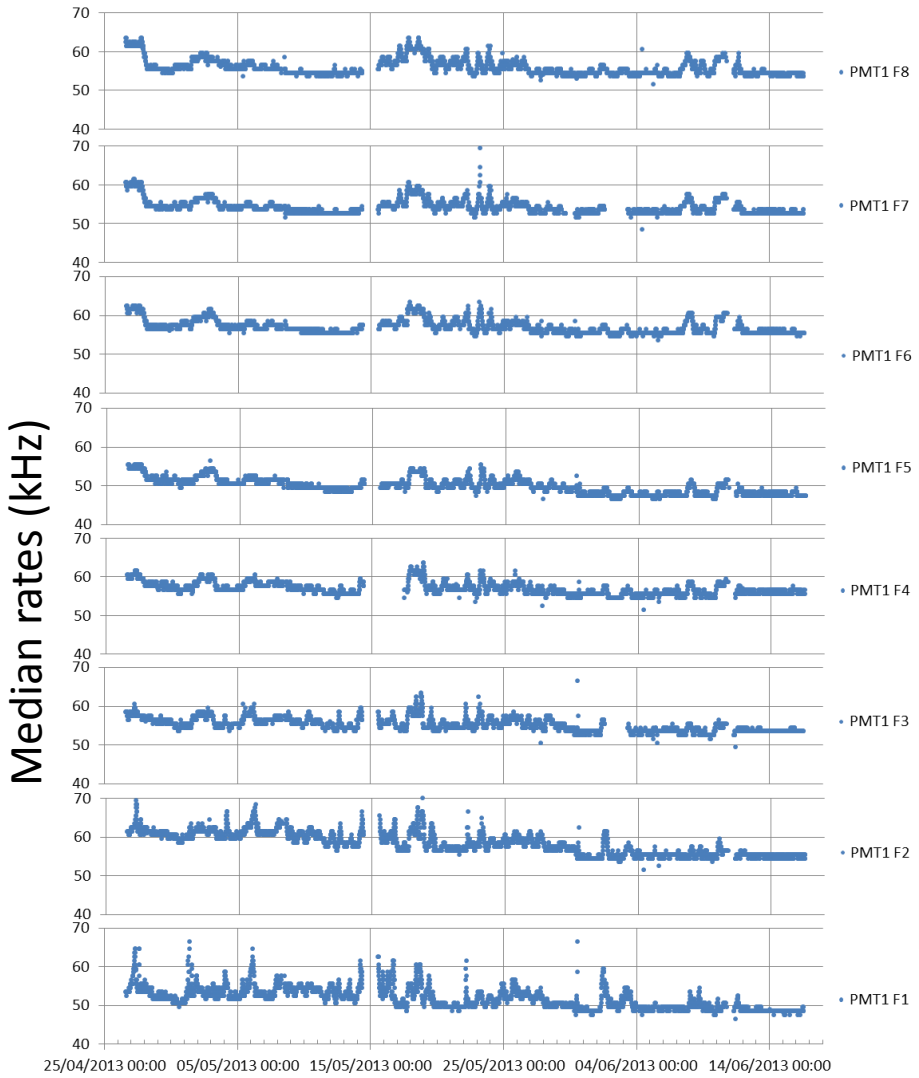
Roll-Pitch correlations





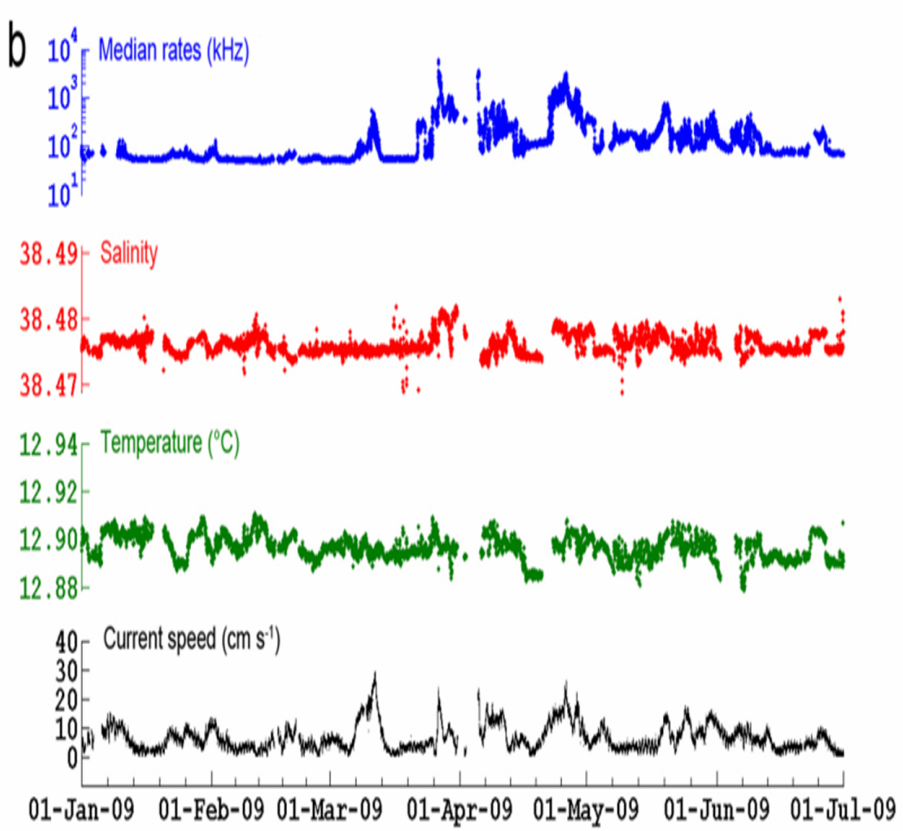
PMT BASELINE COMPARISON

Nemo- Phase2



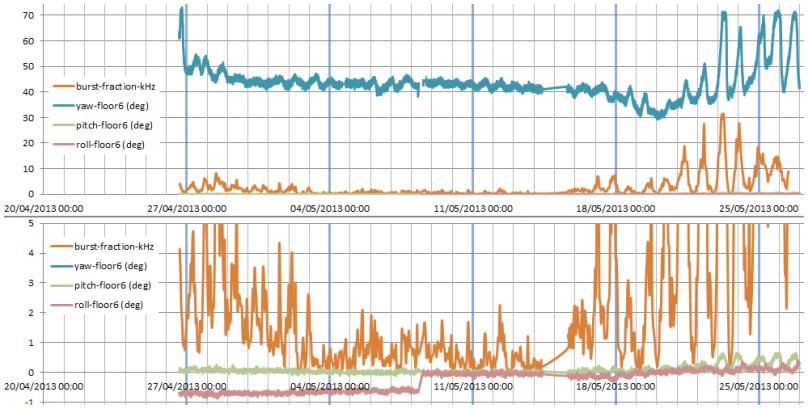
Antares

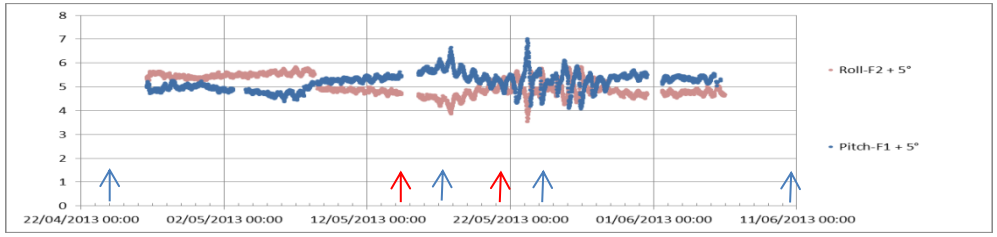
Tamburini et al. accepted PLOS ONE



Median rates are calculated over 15 minutes

To be understood: time correlations between higher amplitude burst fractions (rate) and compass variations.





Istituto Nazionale di Geofisica e Vulcanologia
Sezione di Catania

Gruppo Analisi Dati Sismici INGV - CT

Monitoraggio sismico
aree vulcaniche
Staff
Catalogo terremoti

pagine web a cura di
Salvatore Alparone
Salvatore D'Amico
Vincenza Maiolino
Andrea Ursino

Catalogo dei terremoti della Sicilia Orientale - Calabria Meridionale (1999-2011)

Il catalogo riporta i terremoti localizzati dalla Rete Sismica gestita dall'Istituto Nazionale di Geofisica e Vulcanologia - Sezione di Catania, a partire dal 1999. I dati sono aggiornati con un ritardo di sette giorni dal verificarsi dell'evento sismico, e rappresentano la migliore stima dei parametri ipocentrali; eventuali modifiche possono essere successivamente apportate, senza alcun avviso, qualora ritenuto necessario.

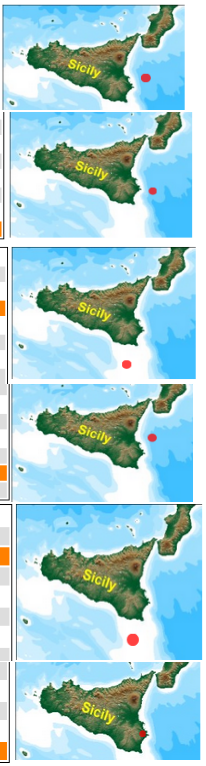
Le localizzazioni vengono effettuate con il software Hypoellipse 2.0 (Lahr, 1989), utilizzando vari modelli di velocità crostale a seconda dell'area sorgente: Hirn et al., (1991) per l'Etna e la Sicilia nord-orientale-Calabria meridionale, Jeffreys and Bullen (1967) per l'arcipelago eoliano, Musumeci et al., (2003) per la Sicilia sud-orientale.

Pagina: |< [1] 2 3 4 5 6 ... 82 164 246 328 410 492 574 656 738 >|

Data	Orario	Magnitudo		Lat	Lon	Prof.	Località epicentrale
10-06-2013	07:35:35	1.0	ML	37.736	15.069	2.6	1.4 km S da Monte Scorsone (CT)
10-06-2013	03:46:59	2.9	ML	37.243	15.816	22.7	50.4 km E da Siracusa (SR)
09-06-2013	09:43:20	1.4	ML	36.890	14.697	22.3	4.6 km SW da Ragusa (RG)
09-06-2013	04:50:31	1.4	ML	37.716	14.888	24.9	2.7 km W da M. Intraleo (CT)
09-06-2013	04:48:12	1.6	ML	37.709	14.882	26.5	2.9 km NW da Contrada Feliciosa (CT)
27-05-2013	21:44:17	1.1	MD	38.394	14.939	4.3	3.1 km SW da Porto di Ponente (Vulcano) (ME)
26-05-2013	23:22:42	1.3	ML	37.919	15.070	22.1	1.3 km E da Malvagna (ME)
26-05-2013	22:57:37	1.2	ML	37.731	15.072	5.2	1.5 km SW da Monte Fontane (CT)
26-05-2013	08:21:17	1.6	ML	38.030	15.079	9.2	2.2 km SW da Tripi (ME)
25-05-2013	07:20:49	1.7	ML	38.292	14.920	9.2	11.0 km N da Capo Calavà (ME)
24-05-2013	19:44:19	1.4	ML	37.685	15.091	3.1	1.5 km SW da Zafferana Etnea (CT)
24-05-2013	12:21:20	2.4	ML	36.960	15.805	25.1	46.2 km E da Siracusa (SR)

Data	Orario	Magnitudo		Lat	Lon	Prof.	Località epicentrale
23-05-2013	13:10:17	1.2	ML	37.691	15.092	6.1	1.2 km W da Zafferana Etnea (CT)
23-05-2013	13:04:48	3.4	ML	37.696	15.089	3.9	1.5 km W da Zafferana Etnea (CT)
21-05-2013	16:33:25	2.8	ML	36.151	14.971	10.3	80.7 km S da Portopalo di Capo Passero (SR)
21-05-2013	01:24:30	1.7	ML	37.709	15.101	6.8	1.9 km N da Zafferana Etnea (CT)
21-05-2013	01:17:37	1.3	ML	37.708	15.103	6.0	1.8 km N da Zafferana Etnea (CT)
21-05-2013	00:33:29	1.1	ML	37.708	15.099	6.2	1.9 km N da Zafferana Etnea (CT)
21-05-2013	00:11:33	1.1	ML	37.713	15.101	5.1	1.7 km SW da Milo (CT)
20-05-2013	15:10:09	1.2	ML	38.205	15.197	13.9	4.3 km SW da Milazzo (ME)
19-05-2013	18:13:12	2.5	MD	38.765	15.714	91.5	18.9 km NW da Tropea (VV)
18-05-2013	20:12:07	2.0	ML	37.112	15.054	9.7	5.4 km SE da Sortino (SR)
17-05-2013	22:45:59	0.8	MD	36.988	14.954	22.2	9.4 km SE da Palazzolo Acreide (SR)
17-05-2013	21:07:13	1.2	ML	38.255	15.116	12.2	11.4 km W da Milazzo (ME)
17-05-2013	05:23:08	2.6	ML	37.395	15.677	29.8	44.3 km NE da Augusta (SR)
16-05-2013	15:40:48	2.9	ML	37.823	16.329	23.6	25.4 km SE da Brancaleone (Marina) (RC)

Data	Orario	Magnitudo		Lat	Lon	Prof.	Località epicentrale
14-05-2013	15:43:24	2.7	ML	37.170	15.947	27.9	59.6 km E da Siracusa (SR)
14-05-2013	13:51:57	3.4	ML	36.215	14.987	3.0	53.5 km S da Portopalo di Capo Passero (SR)
14-05-2013	02:59:02	3.2	ML	38.743	15.580	279.2	28.1 km NW da Ricadi (VV)
13-05-2013	22:37:26	1.0	ML	38.100	15.120	5.7	0.6 km SW da Furnari (ME)
13-05-2013	22:16:07	1.6	ML	38.129	15.800	12.0	4.4 km S da Santo Stefano in Aspromonte (RC)
13-05-2013	17:52:01	1.4	ML	37.644	14.949	4.6	1.2 km NE da Ragalna (CT)
11-05-2013	17:49:01	2.2	ML	38.446	15.619	131.4	22.3 km NW da Palmi (RC)
27-04-2013	20:27:35	2.6	ML	38.409	15.231	112.9	20.5 km N da Milazzo (ME)
26-04-2013	23:05:18	1.6	ML	37.924	14.920	29.4	3.9 km W da Santa Domenica Vittoria (ME)
26-04-2013	23:04:15	1.4	ML	37.937	14.921	29.1	4.4 km NW da Santa Domenica Vittoria (ME)
24-04-2013	20:46:01	2.0	ML	37.846	15.608	25.1	17.5 km SW da Melito di Porto Salvo (RC)
24-04-2013	01:08:35	1.9	ML	37.031	15.305	24.2	5.9 km S da Siracusa (SR)



Citabile come:
Gruppo Analisi Dati Sismici, 2013. *Catalogo dei terremoti della Sicilia Orientale - Calabria Meridionale (1999-2011). INGV, Catania*
http://www.ct.ingv.it/ufs/analisti/catalogolist.php