

Monte Carlo Activities



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A. R. R. R.

Outline

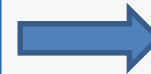
- Working group organization
- Status and perspectives of the activities
 - ✓ SNR and GRB simulations
 - ✓ GW transients follow-up
 - ✓ Divergent pointing simulations
 - ✓ SCT focal plane simulations
 - ✓ MAGIC simulation with CTA tools
 - ✓ atmospheric calibration

Outline

■ Working group organization

■ Status and perspectives of the activities

- ✓ SNR and GRB simulations
- ✓ GW transients follow-up
- ✓ Divergent pointing simulations



Reports from:

- Leonardo
- Franz
- Tristano
- Alice

- ✓ SCT focal plane simulations
- ✓ MAGIC simulation with CTA tools
- ✓ atmospheric calibration



News from Franz

■ CNAF situation

WG organization

- Mailing list: cta-infn-mc@lists.infn.it



- Documents and minutes: (Alfresco, folder MC)
<https://docs.infn.it/share/page/site/cta/documentlibrary>



- Meetings:

- ✓ biweekly eZuce (Monday 15:30)

- ✓ once a month: CTA ASWG (convener: Gernot Maier)

- ✓ when needed: CTA divergent pointing group

- ✓ ...

Comparison between Hamamatsu and FBK SiPMs for SCT

Update dal gruppo MC (R. Carosi, P. Da Vela, A. Rugliancich):

Stiamo simulando un array di SCT (18 telescopi) in diverse configurazioni che rispecchiano le differenze tra sensori Hamamatsu e FBK.

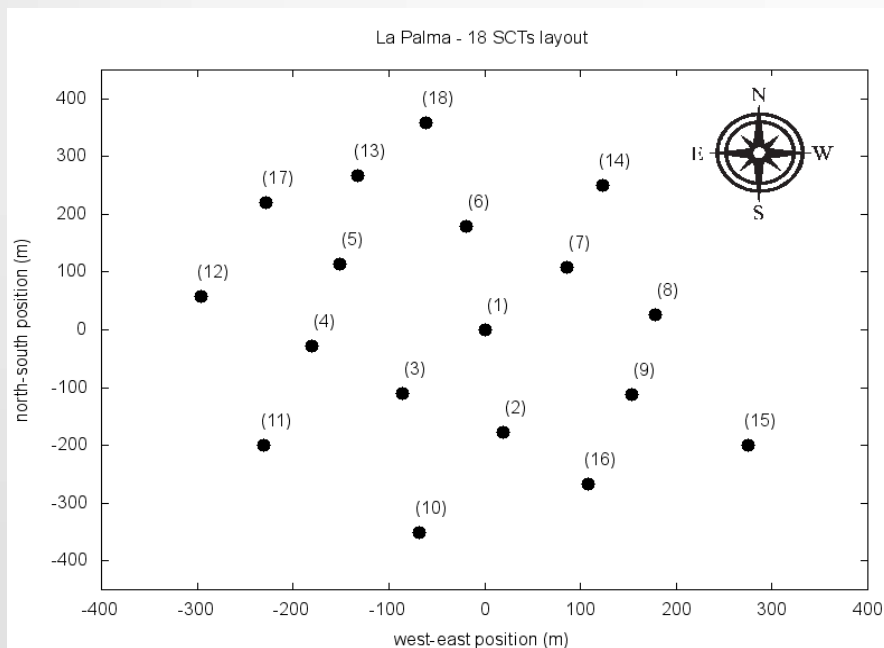
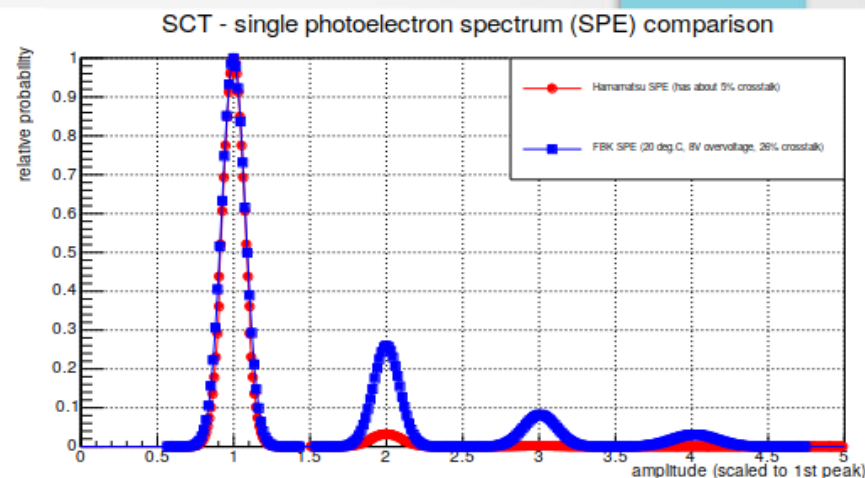
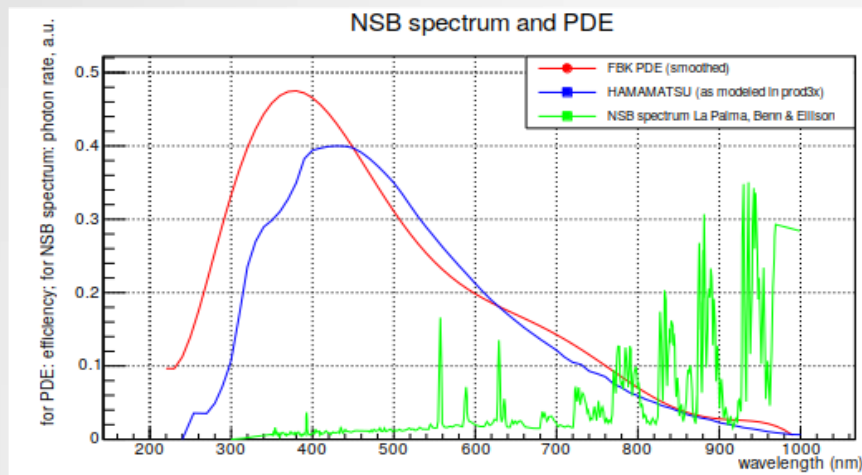
Il lavoro in corso consiste nel valutare l'effetto di:

- diversa photo-detection efficiency (PDE)
- diverso crosstalk (SPE)

È stato stimato l'impatto di una diversa PDE, era in corso l'analisi dell'impatto della SPE (novembre 2017).

Purtroppo il CNAF è fuori uso a partire dal 9 novembre 2017 a causa di un incidente, siamo in attesa che il servizio venga ripristinato. La migrazione immediata verso altri servizi (ad esempio, GRID CTA) avrebbe comportato la riscrittura di tutti gli script di simulazione e analisi finora realizzati.

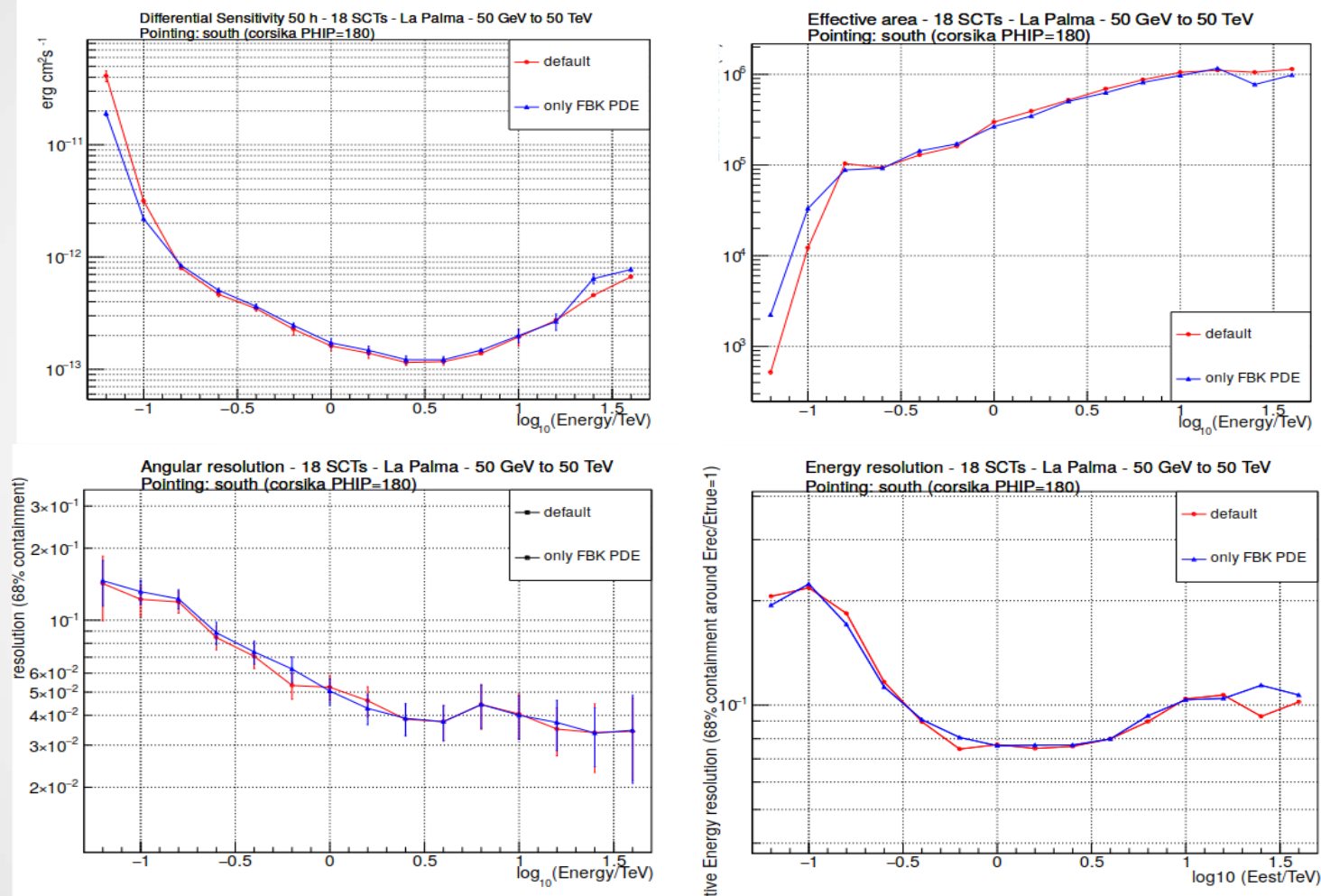
Comparison between Hamamatsu and FBK SiPMs for SCT



• Simulati:

- 6×10^6 gamma
- 6×10^6 elettroni
- 60×10^6 protoni

Comparison between Hamamatsu and FBK SiPMs for SCT



La differenza si osserva solo a basse energie nel plot della sensitivity/effective area.

MAGIC simulation with CTA tools

■ Aims:

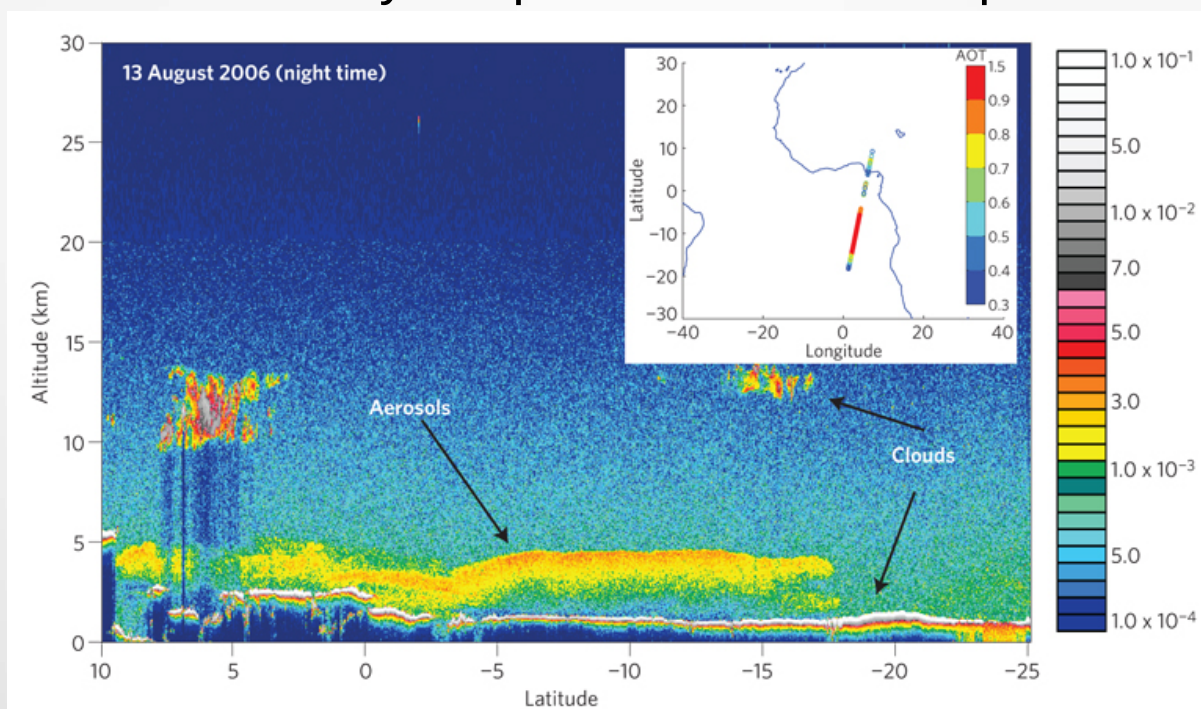
- ✓ to cross-check CTA MC tools using MAGIC
- ✓ to be prepared for LST1 commissioning



- The Rijeka group (Sasa Mikanovic, Djiana...) already implemented the MAGIC telescope in sim_telarray (optics and camera).
- Possible contribution: trigger simulation.

Atmospheric simulations

- INFN groups (Napoli, L'Aquila, Torino) are part of the CCF WP
- Raman LIDAR "ARCADE"
- atmospheric simulations (**ccf-atmosim group**)
 - to study the effect of the different atmospheric profiles on the Observatory performance
 - to include the atmospheric calibrations in the generation of MC
- No news since one year: possible doc thesis/postdoc?



INFN contributions to CTA (Computing)

- **Presently** CNAF resources for:
 - **CTA Computing Grid** (CE, SE) (4th both Storage and CPU)
 - **INFN users** community (10 TB)
- additional contributions to Grid from INFN Frascati, To, Na

2017

- Disk = 496 TB, Tape = 120 TB;
- Computing power = 4000 HS06;

2018

- Disk = +300 TB
- *and merging with MAGIC resources (296 HS06, 65/150 TB disk/tape)*

2019

- Disk = +200 TB, CPU = +1000 HS06

INFN contributions to CTA (Computing)

Impact for CTA storage (slide from last CTACG call)



- Disk status
 - Total used in 2017: +492 TB
 - Prod3b La Palma = 443 TB (end 2016 + beginning 2017)
 - Baseline reference La Palma = 24 TB
 - Baseline High NSB Paranal = 25 TB
 - Other smaller productions
 - Obtained last year: +586 TB (+ 80 TB added at IN2P3-CC in July)
 - Full at 91%

Disk resources

Site	Available (TB)	Used (TB)	Total (TB)
CYFRONET-LCG2	14	614	628
DESY-ZEUTHEN	145	910	1055
IN2P3-CC	93	339	432
GRIF (LPNHE +CEA)	16 (7+9)	215 (112+103)	232 (120+112)
IN2P3-LAPP	2	116	118
! INFN-T1	2	494	496
Total	272	2688 (91%)	2961



INFN-T1 flooded last week!

- The impact on CTA data not known yet (prod3b, prod3)
- We will probably need to re-run some productions

Tape resources

Site	Available (TB)	Used (TB)	Total (TB)
DESY-ZEUTHEN	115	170	285
IN2P3-CC	165	245	410
! INFN-T1	105	25	130
Total	385	440 (53%)	825

- Used to archive old datasets before final deletion (prod2)

CNAF situation after flooding (L. Arrabito)

CNAF flooded 15 days ago (15/11)



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CNAF situation after flooding (L. Arrabito)

Room 1



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CNAF situation after flooding (L. Arrabito)



Incident report

- Serious damages to the whole infrastructure
 - Power center
 - Part of the disks and tapes lost
- They will try to recover 700 wet disks and 150 tapes
- They aim to have a power line ready for mid-January
- We don't know if and when we will be able to recover 500 TB of CTA disk

Next speakers

- SNR simulations (Leonardo Di Venere)
- GRB simulations (Francesco Longo)
- Divergent pointing simulations (Alice Donini)

