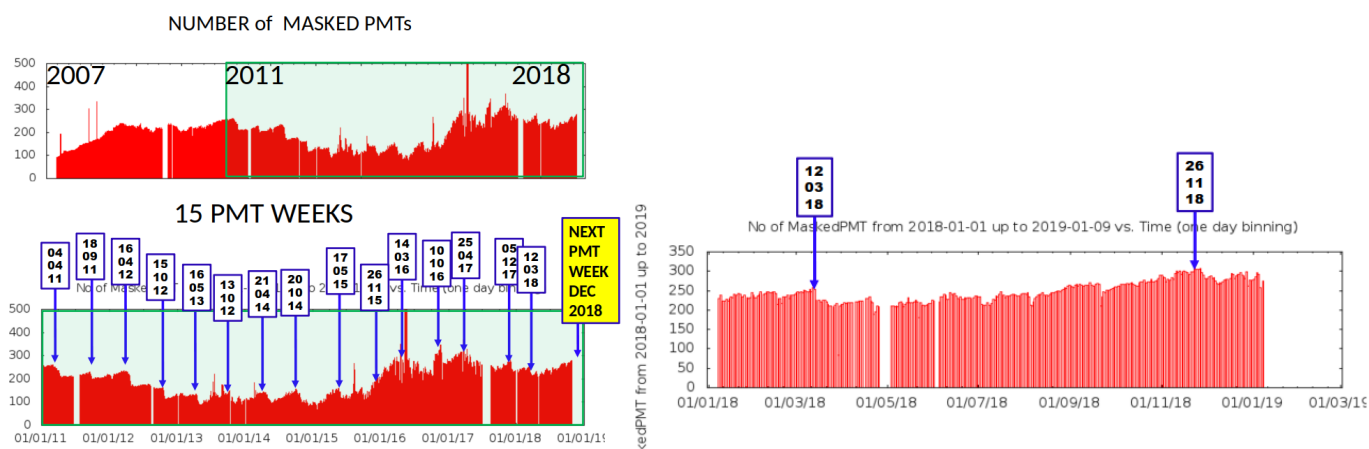# Report on November-December 2018 PMTs and SmallPMTs weeks

(Antonio Zampieri from 26/11 to 7/12,

Giorgio Dho, Alessio Gorgi and Thi Nguyen Trung from 3/12 to 14/12)

Maintenance: November-December 2018 campaign

The plots show the evolution in time of the number of masked PMTs in the field, not usable for the data acquisition according to an automatic check on the monitoring data.
In the top-left plot, the green shaded area shows the period after the activation of the PMT weeks, that are shown in the bottom-left plot. The plot on the right shows what happened in 2018.

The Sdeco staff prepared for the December 2018 campaign 42 PMTs and Fabian Gobbi prepared a list of tanks to be repaired, with a priority given to black tanks and tanks with 2 masked PMTs.

At our arrival in Malargue there were, in the priority list of interventions:

- 28 black tanks (but only 16 were in a region were we could operate, 11 are not accessible according to landowner will; 9 station are left down after someone have stolen some components, some of them in an area were the landowners don't allow us to operate);
- 2 tanks (Campanita ed Edelweiss) broken (no replacement available);

- 11 tanks with 2 masked PMTs (22 PMTs to be repaired);
- 17 PMTs with short circuit of capacitors (can be repaired in the field);
- 60 with problem in HV modules;

in the previous lists there are overlaps since black tanks may have broken PMTs.

In this campaign 35 PMTs were replaced and more than 7 bases were repaired in the field.
The list of interventions registered in the electronic logbook is available as appendix.

PMT status and activities at Sdeco

Since last campaign only 2 PMTs were lost : 1 found without photocatode and the other with internal damage at dynode structure.

Sdeco staff, (Mauro y Juan Pablo), think they can count now on about 80 PMTs: 7 repaired, 9 still to be completed, 64 pmts that needs to be cleaned and/or tested.

During the period Thi worked at Sdeco with Mauro and Juan Pablo repairing PMT bases and selecting the HV modules to be brought to Torino.

HV modules at Sdeco

A selection of broken HV modules have been tested and repaired in the INFN-Torino electronic workshop since 2017. For this shift, 26 recovered ones have been brought back to Malargue after having been tested in our climatic chamber.
Currently Sdeco staff can count on at least 33 good HV module for the next campaign.

HV modules repairing in Torino

In Torino we have more than 40 modules to be repaired, including some just arrived from Malargue. They will be repaired and checked before next campaign.

2019 campaigns

We already planned next campaign for the end of April (29/4-10/5), Mauro Gajardo and Juan Pablo Gongora should prepare as much PMTs as possible before our arrival; Gualberto Avila has been contacted to inform him and ask him to organize the activities.

Spmt and Engineering Array status

While in Malargue, we worked on the software needed to calibrate and monitor the small PMT. Ricardo Sato checked it. A test in the field will be performed as soon as possible depending on his commitments.
We replaced the remaining photomultiplier Hamamatsu R6094 with a photomultiplier Hamamatsu R8619 with flying leads.
A fast procedure to test the small PMTs at their arrival at the observatory have been shown and explained to the staff
At the Observatory about 700 stabilizer disks have been prepared, to be used during small PMT installation. The remaining disks will be prepared in the future using the material already available at the observatory.

Malargue, 15/12/2018

Giorgio Dho, Alessio Gorgi and Antonio Zampieri

Appendix: List of interventions during the campaign (unfortunately partial)

26-11-2018

-LS 381 - Jeremias
Reemplazos en Serial - Cambio de PMT1 (- (1629 => 1161))

Team: Mauro y Andrés

27-11-2018

-LS 423 - Kiko
Remplazos en Serial - Cambio de PMT1 (- (1882 => 4991))
Remplazos en Serial - Cambio de PMT2 (- (2654 => 7333))

LS 1159 - Cora
Reemplazos en Serial - Cambio de PMT3 (- (5698 => 1591))

-LS 1358 - Bloodflowers
Chagen capacitors c6, c7 amd c8 in PMTT2 and PMT3

-LS 1394 - Ratschek
Reemplazos en Serial - Cambio de PMT3 (- (7317 => 7351))

Team: Juan Pablo y Antonio Zampieri
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28-11-2018

- LS 1348 - Huenu Leufu Jr.
Remplazos en Serial - Cambio de PMT3 (se reemplazo por problemas de cortocircuito en linea 12v, el corto esta en el interior del modulo HV, anteriormente se le habian cambiado los capacitores de linea 12v C11 y C30 - (7428 => 2206))

-LS 1423 - Selassie
Remplazos en Serial - Cambio de PMT2 (- (6369 => 6296))

-LS 1448 - Abril
PMT & Electrónica - Cambio del capacitor C30 - PMT2 ()

-LS 1533 - Cone
Remplazos en Serial - Cambio de PMT1 (desconectado, aparentemente corto en modulo HV - (6225 => 1872))

Remplazos en Serial - Cambio de PMT2 - (6530 => 6164))
Remplazos en Serial - Cambio de PMT3 - (6543 => 3216))

Team: Juan Pablo y Antonio Zampieri

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29-11-2018

-LS 1614 - Emil
Reemplazos en Serial - Cambio de PMT1 (- (7075 => 3678))

-LS 1616 - Robert Smith
Reemplazos en Serial - Cambio de PMT1 (- (7462 => 3453))

-LS 1664 - Astor
Reemplazos en Serial - Cambio de PMT1 (- (5956 => 5350))
Lista de estados que declaró: (1 state)
PMT & Electrónica - Otros - PMT3: - (por algún motivo, el pmt quedo sin señal de dinodo,probablemente el conector quedo en cortocircuito al mover la electrónica. No se pudo continuar con el trabajo debido a fuerte tormenta)

Team: Juan Pablo y Antonio Zampieri

-LS 1626 - Sherlock Homes   Remplazos en Serial - Cambio de PMT2 (el PMT necesitaba reparación de corto, pero fue imposibledespegar el fest del PMT y se tuvo que cambiar - (7278 => 3373))
-LS 1667 - Magisterio-CN
PMT & Electrónica - Cambio del capacitor C11 - PMT2 (se cambio capacitor en corto)

-LS 1669 - Natasha
Remplazos en Serial - Cambio de PMT1 (se cambio por tener HV - (6726 => 1718))

Team: Raúl y Oscar

30-11-2018

-LS 1373 - Grapa
PMT & Electrónica - Cambio del capacitor C11 - PMT2 ()

-LS 1419 - Sigurd
Reemplazos en Serial - Cambio de PMT1 (- (6794 => 7191))

-LS 1420 - Liliput
Reemplazos en Serial - Cambio de PMT1 (- (6739 => 3434))

-LS 1421 - Ebicykl
Reemplazos en Serial - Cambio de PMT2 (- (6755 => 2910))

Team: Juan Pablo y Antonio Zampieri

03-12-2018

-LS 361 - Orion
Comentarios generales sobre la intervención en esta estación:
se cambio PMT 2 y 3 HV
Lista de acción que declaró: (2 actions)
Remplazos en Serial - Cambio de PMT2 (HV - (1738 => 2033))
Remplazos en Serial - Cambio de PMT3 (HV - (1970 => 1486))

-LS 433 - Vieira
Comentarios generales sobre la intervención en esta estación:
se cambio PMT2 y 3
Lista de acción que declaró: (2 actions)
Remplazos en Serial - Cambio de PMT2 (cambiar no detalla problema la lista - (7498 => 7450))
Remplazos en Serial - Cambio de PMT3 (cambiar no detalla problema la lista - (5486 => 7255))

04-12-2018
LS 1089 - Baqueano
Remplazos en Serial - Cambio de PMT3 (- (5490 => 7224))

-LS 1291 - Minessota
Remplazos en Serial - Cambio de PMT2 (- (6034 => 6018))

-LS 1397 - Heidemarie
Remplazos en Serial - Cambio de PMT2 (- (6590 => 7117))

Team: Juan Pablo y Antonio Zampieri

-LS 1318 - Jujuy
Reemplazos en Serial - Cambio de PMT2 (No calibraba - (6142 => 7228))
Reemplazos en Serial - Cambio de PMT3 (HV - (1566 => 7490))

Team: Raúl y Oscar

-LS 80 - Romeri
Remplazos en Serial - Cambio de PMT1 (hv(Imon, Vmon y señal) - (4806 => 5214))

-LS 924 - Mamuti
PMT & Electrónica - Cambio del capacitor C11 - PMT1 ()