Status of the plans for 2020

Analyses and Simulation

- Finalise ^{55}Fe analisys: camera+PMT (Igor) [January]**[Done]**

- Evaluate sensor noise behavior for threshold settings (Brazilian) [February]**[In progress]**

- AmBe data analysis toward a PID efficiency and rejection factor paper (Emanuele) [February]**[In progress]**

- finalise BTF analysis for the “Tracking performance paper” (Giovanni M) [February]**[Done]**

- “digitise” Marconato data on 1 keV->100 keV nuclear recoils for CMOS (Fabrizio/Flavio) [January]**[Done]**

- “digitise” Marconato data on 1 keV->100 keV nuclear recoils for PMT (GSSI) [January]**[ToDo]**

- analyse them (PMT+CMOS) and compare results to get a rejection factor (Fabrizio) [February]**[In progress]**

- we need an evaluation of CYGNO rejection factor in the 1-20 keV range: 10^3? 10^4? [February]**[In progress]**

- fix shielding scheme parameters for CYGNO (Giulia) [February]**[Done]**

- LIME shielding and background simulation (Andrè) **[In progress]**

CYGNO drawings

To start we need last inputs from Simulation about:

- plexiglass width;
- copper width;

Roma1 [February] **[Done]**

Definition of the services (HV, gas, LV); LNF [April] **[In progress]**

- Once we have, we can close drawings of these parts;

Meanwhile we choose low radioactive materials and techniques GSSI (?) [February] **[In progress]**

- Once we have we can start material procurement; Roma1 [July] **[ToDo]**

We can start assemble CYGNO sensitive part ([er] Core); LNF [September] **[ToDo]**

Radioactivity

- Contact people working with low radioactive Plexiglass and understand how to get it (Betta); [February] **[In progress]**

- Contact people working with low radioactive Cupper and understand how to get it (Betta); [February] **[In progress]**

- Contact people working with low radioactive quarz-glass for lens (Heraeus) and understand how to get it (Francesco); [February] **[In progress]**

- Contact people working with CMOS sensors (Teledyne, Hamamatsu) to study possibility of custom sensor (Davide); [February] **[In progress]**

- Get results of radioactivity measurements of sensors and measure the new cameras: Fusion, Teledyne (Betta) [March] **[In progress]**

Radioactivity

Camera	Sensitivity (eV/count)	Resolution (%)	Noise (eV)	^{228}Ra (Bq)	^{228}Th (Bq)	^{226}Ra (Bq)	^{234}Pa (Bq)	^{40}K (Bq)	Total activity
Hamamatsu ORCA FLASH 4.0	2.96	15.2	4.6	2.1	2.1	1.9	7.0	1.9	15.0
ORCA FLASH sensor	2.6	15.2	8	1.0	1.0	1.1	1.1	4.3	8.5
Photometrics Prime BSI Mode 1	3.3	19.0	9.7	-	-	-	-	-	tbm
Photometrics Prime BSI Mode 2	1.12	16.4	4.5	-	-	-	-	-	tbm
Photometrics BSI Express Mode 2	0.84	13.4	3.0	1.3	1.8	1.0	6.0	3.6	13.7
Hamamatsu Fusion Closer (LEMON)	0.65	17.5	1.58	-	-	-	-	-	tbm
Hamamatsu Fusion Farther (LIME)	0.85	16.4	2.06	-	-	-	-	-	tbm
Thorlab Quantalux	tbm	tbm	tbm	0.3	0.6	0.2	3.0	1.2	5.3

Background effect simulation

Study with the simulation the performance of CYGNO in different background scenarios (GSSI). [February] **[In progress]**

DAQ

Organise a meeting with them (Andrea, Francesco I.); [January] **[Done]**

Test all PMT/SiPM we have to decide what to use (Francesco I.); [February] **[In progress]**

Collaboration

- Send a proposal

(Davide for Brazil and Betta for other ones) [February] **[In progress]**

- Organise a General Meeting (Betta). [January] **[ToDo]**

Paper list

Title	Corr Author	Status	Reviewer	Journal	RD51
Solar neutrino proposal	Elisabetta				
AmBe analysis	Emanuele	30%		JINST	
Comparison of performance 60/40 and 70/30 (incl. stability)	Davide	70%		JINST	Yes
Effect of filters on CYGNO images	Rafael				
The Cygno Experiment	Davide				
Tracking Performance (aka BTF paper)	Giovanni	90%		JINST	
Luminescence	Davide	95%		JINST	Yes
Saturation studies and possible correction	Francesco	50%			Yes
Performance of i2DBSCAN and comparison with NNC	Igor	70%			
Study and simulation of sensor noise	Rafael	50%			
Study of sensors performance and radioactivity	Volunteer?				
LNGS Report	Elisabetta	100%			

https://docs.google.com/spreadsheets/d/1_zjPUDHIu6x4tg9fRsclpGZKSjKhaydTmrxkIVip-ZU/edit?usp=sharing

Shopping list

Item	Code	Company	Q.ty	Who buys	Cost	Fund	Status	Where is	Note
HV for 2-Triple GEM	A1515TG	CAEN	1	Davide	6200	INITIUM	RDA		
Crate for HV-GEM	SY4527LC	CAEN	1	Davide	<5900	INITIUM	RDA		
Camera CMOS	Orca FUSION	Hamamatsu	1	Davide	12000	INITIUM			
Optics	tbd	tbd	2	Francesco R	tbd	CYGNO			
PC for DAQ	tbd	tbd	1	Francesco I	tbd	CYGNO			
PC for Slow Control	M920 32MB	Convenzione	1	Francesco R	734	INITIUM			
HV for Cathode	H500705n	ISEG	1	Francesco R	tbd	INITIUM			
Switches for LNGS	tbd	tbd	3	Giovanni M	tbd	INITIUM			
Helium Bottles	tbd	tbd	5	Giovanni M	tbd	CYGNO			
CF4 Bottels	tbd	tbd	5	Giovanni M	tbd	CYGNO			
Water Chiller	tbd	tbd	1	Giovanni M	tbd	INITIUM			
PC di servizio LNF	tbd	tbd	1	Giovanni M	tbd	INITIUM			
VME electronics	tbd	CAEN	1	Francesco R	tbd	CYGNO	Richiesta offerta		
T and P sensors	tbd	RS	1	Francesco R	tbd	CYGNO			

https://docs.google.com/spreadsheets/d/1_zjPUDHIu6x4tg9fRsclpGZKSjKhaydTmrxkIVip-ZU/edit?usp=sharing