

Data Taking, Calibrations, Measurements and Analysis with SK I - VII

Nataly Ospina (University Autonoma Madrid)

**Presenter: Luis Labarga (UAM)*

Participating researchers: Luis Labarga (UAM), Pablo Fernández (DIPC), Bryan Zaldivar (UAM), Dustin Samudio (UAM)

Results

UAM is the only Spanish institution belonging to SK: it is fundamental for SK to continue with the work performs from the UAM and the close collaboration with ICRR colleagues

UAM has been granted with ICRR-IURP projects since 2019:

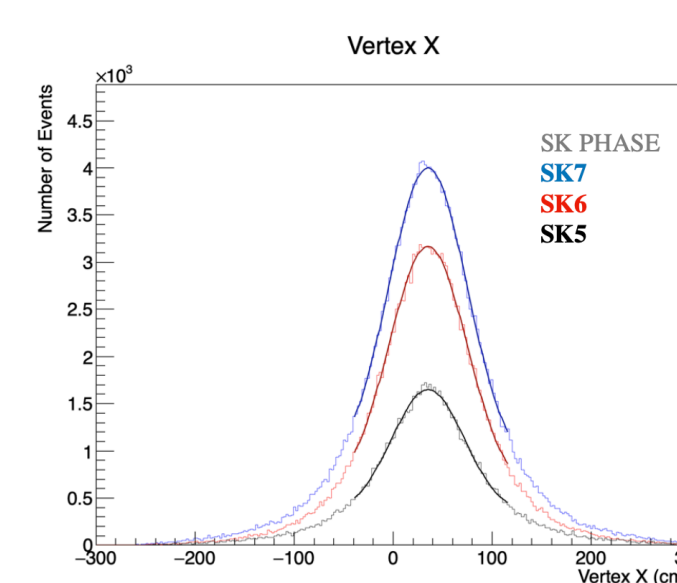
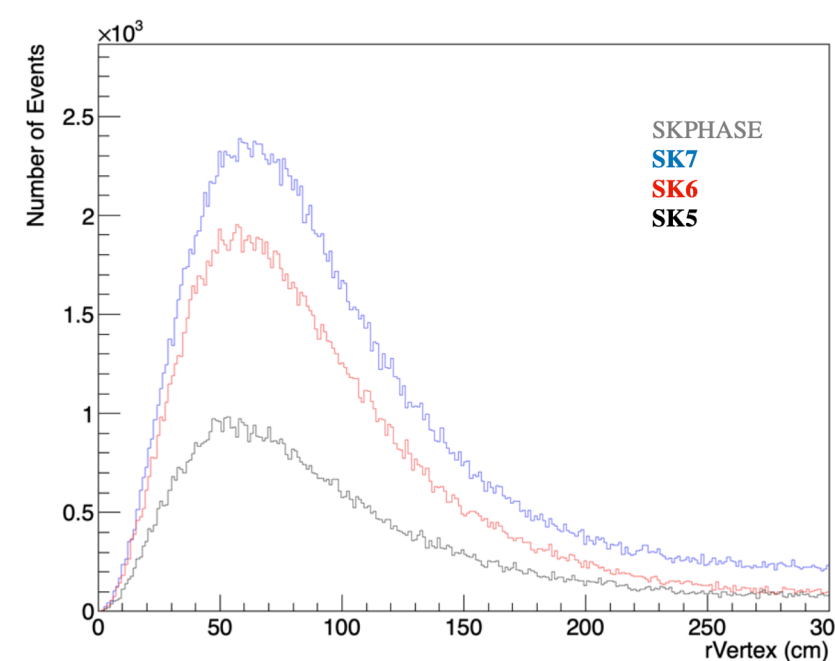
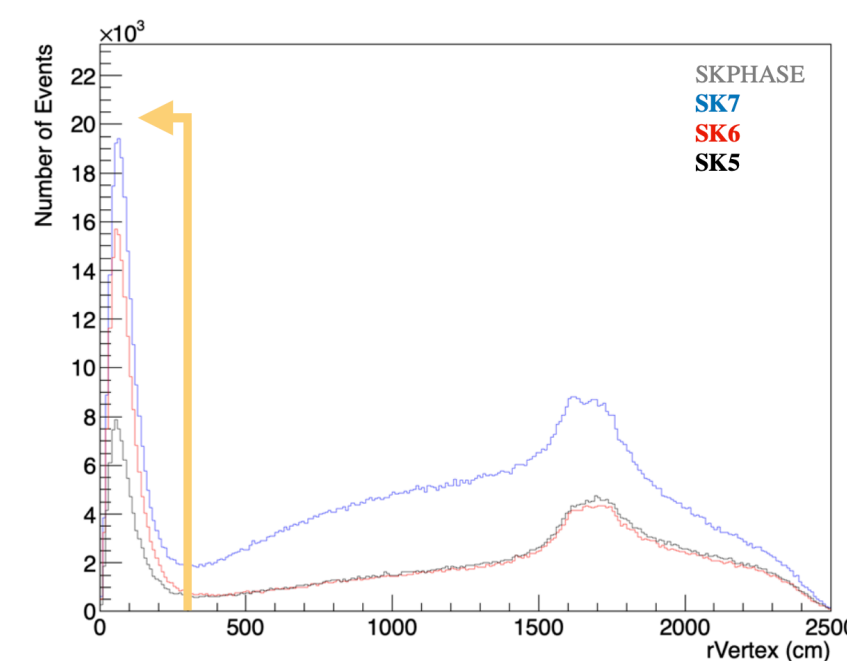
- ✦ A05, A03: for UAM works on Super-Kamiokande I – VIII
- ✦ B01, B03: for UAM contributions to the construction of the Hyper-Kamiokande experiment

Calibration and related works

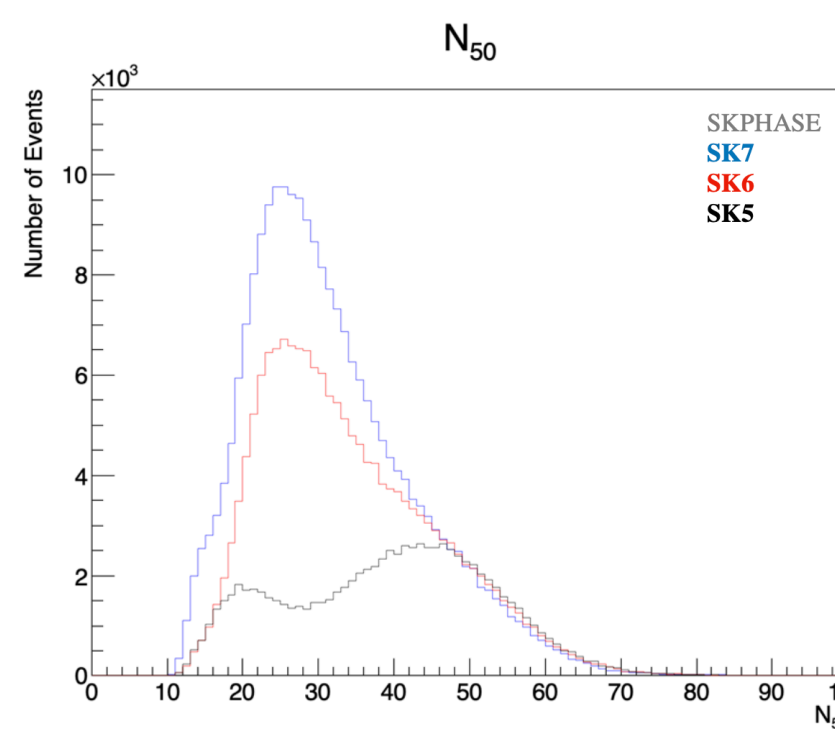
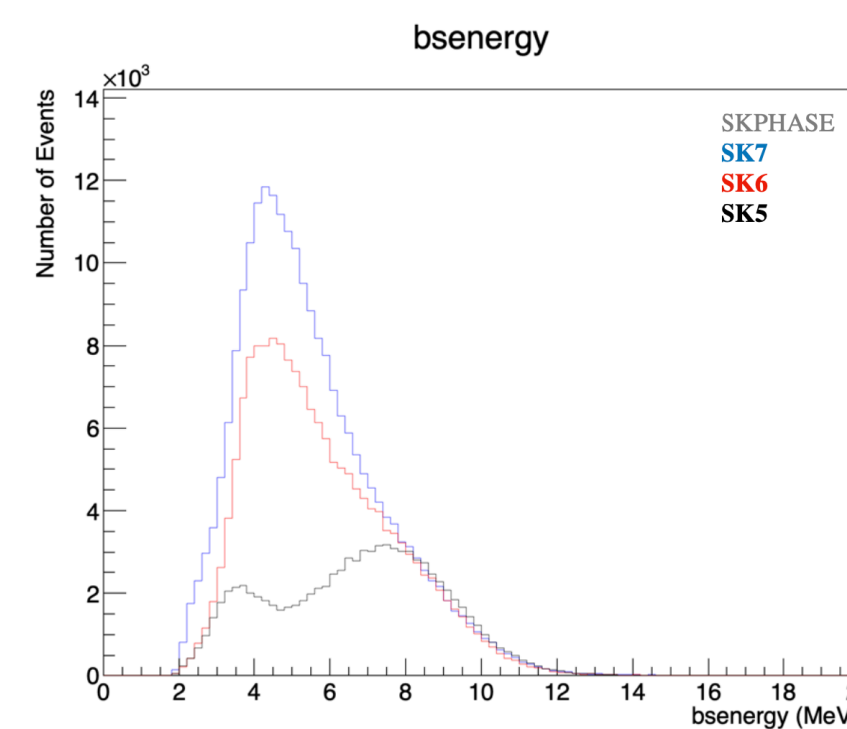
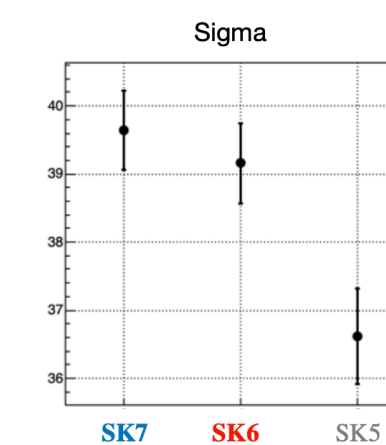
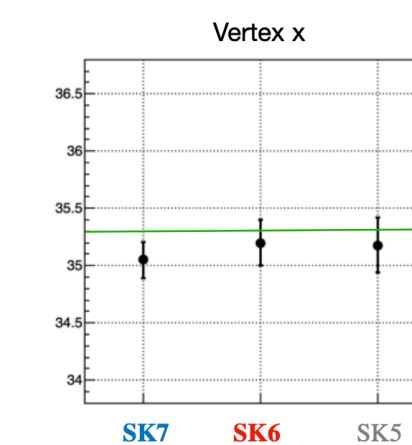
◆ See more details in LL presentation 2024i-B-002 [by Luis Labarga]

◆ NiCf event generation with SKG4:

Comparisons of: vertex reconstruction, N50, BsEnergy for **SKV, SKVI and SKVII.**



Vertex X Distribution



Fit	SK7	SK6	SK5
Entries	226097	169454	88832
χ^2 / ndf	54.41 / 62	77.8 / 62	71.08 / 62
Vertex x	35.05±0.16	35.2±0.2	35.18±0.24
Sigma	39.64±0.58	39.16±0.59	36.61±0.70

- reconstructed X-vertex consistent with nominal
- X-vertex resolution slightly better at SK-V

[by Dustin Samudio]

Results

UAM is the only Spanish institution belonging to SK: it is fundamental for SK to continue with the work performs from the UAM and the close collaboration with ICRR colleagues

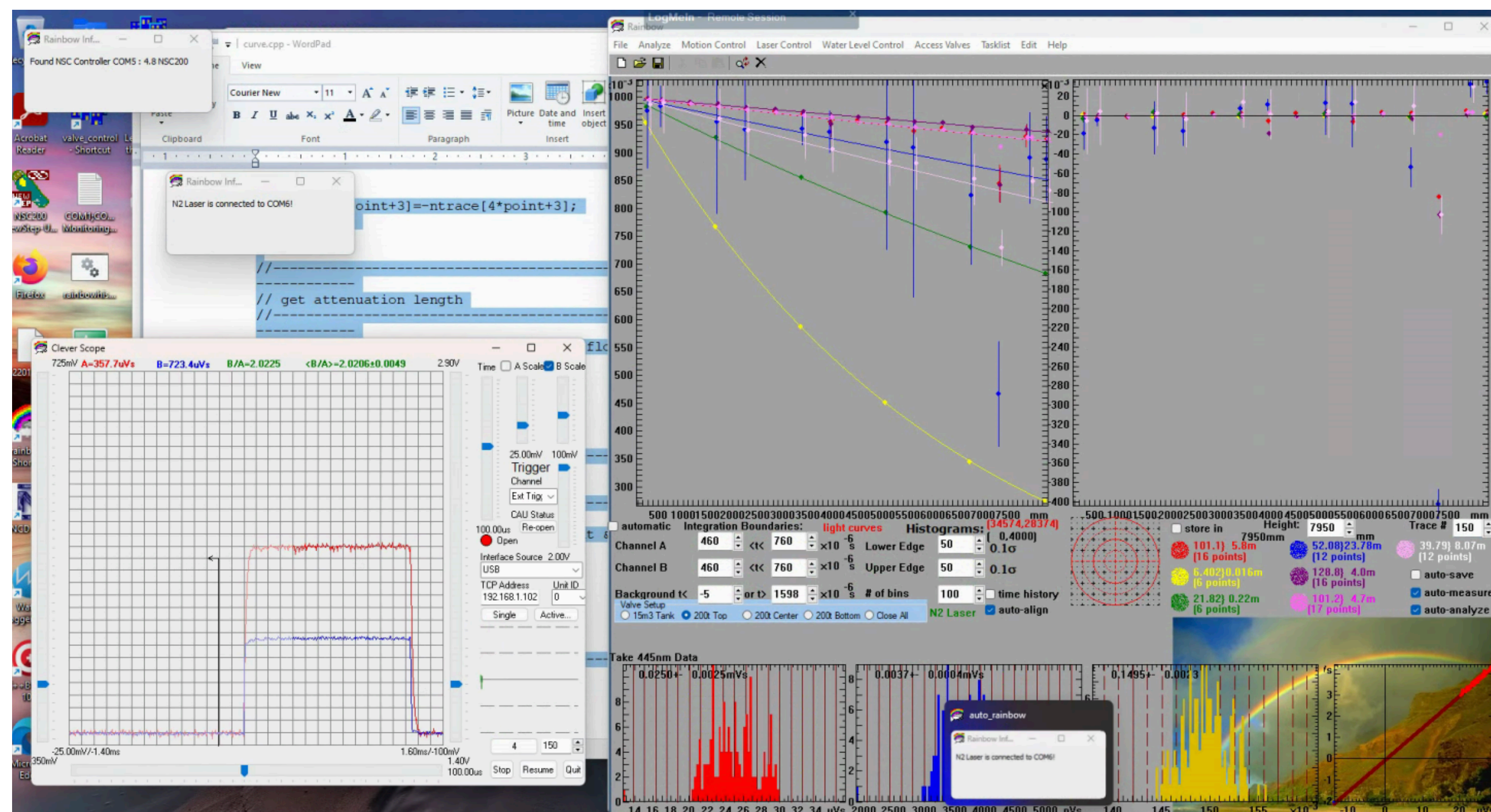
UAM has been granted with ICRR-IURP projects since 2019:

- ✦ A05, A03: for UAM works on Super-Kamiokande I – VIII
- ✦ B01, B03: for UAM contributions to the construction of the Hyper-Kamiokande experiment

UDEAL

Maintenance and monitoring UDEAL:
6 months/year

status of UDEAL						
	A	B	C	D	E	F
1	O		daily check	onsite experts	Note	
2		2025/1/1 Wednesday	Nataly	Moriyama	OK but access violation. Killed by task manager	
3		2025/1/2 Thursday		Moriyama	OK but access violation. Killed by task manager	
4		2025/1/3 Friday		Moriyama	OK; but abnormal program termination	
5		2025/1/4 Saturday		Moriyama	Just top and a huge value. Error in laser.	
6		2025/1/5 Sunday		Moriyama	No data; rainbow was frozen. Killed by task man	
7		2025/1/6 Monday	Moriyama	Kai	OK; At 0:04, confirmed it started to run but it see	
8		2025/1/7 Tuesday		Kai	OK; Center at 7 am.	
9		2025/1/8 Wednesday		Kai	OK; Center at 9 am.	
10		2025/1/9 Thursday		Kai	OK; At 1 pm, still top. The laser spot does not sh	
11		2025/1/10 Friday		Kai	no data because the daq for the last day finishc	
12		2025/1/11 Saturday		Kai	OK; Center at 11 am.	
13		2025/1/12 Sunday		Kai	OK; Bottom at 2 pm. No impact by the power out	
14		2025/1/13 Monday	Nataly	Moriyama	OK	
15		2025/1/14 Tuesday		Moriyama	OK	
16		2025/1/15 Wednesday		Moriyama	OK; but abnormal program termination. Killed by	
17		2025/1/16 Thursday		Moriyama	top and center. Computer automatically restartc	
18		2025/1/17 Friday		Moriyama	OK	
19		2025/1/18 Saturday		Moriyama	OK; but access violation. Killed by task manager	
20		2025/1/19 Sunday		Moriyama	OK; but access violation. Killed by task manager	
21		2025/1/20 Monday	Kai	Kai	was ready to run before midnight, no data but a	
22		2025/1/21 Tuesday		Kai	OK	
23		2025/1/22 Wednesday		Kai	OK	
24		2025/1/23 Thursday		Kai	OK, but had to be killed	
25		2025/1/24 Friday		Kai	OK, but had to be killed	
26		2025/1/25 Saturday		Kai	OK, - somebody is working on something.	



[by Nataly Ospina]

Results

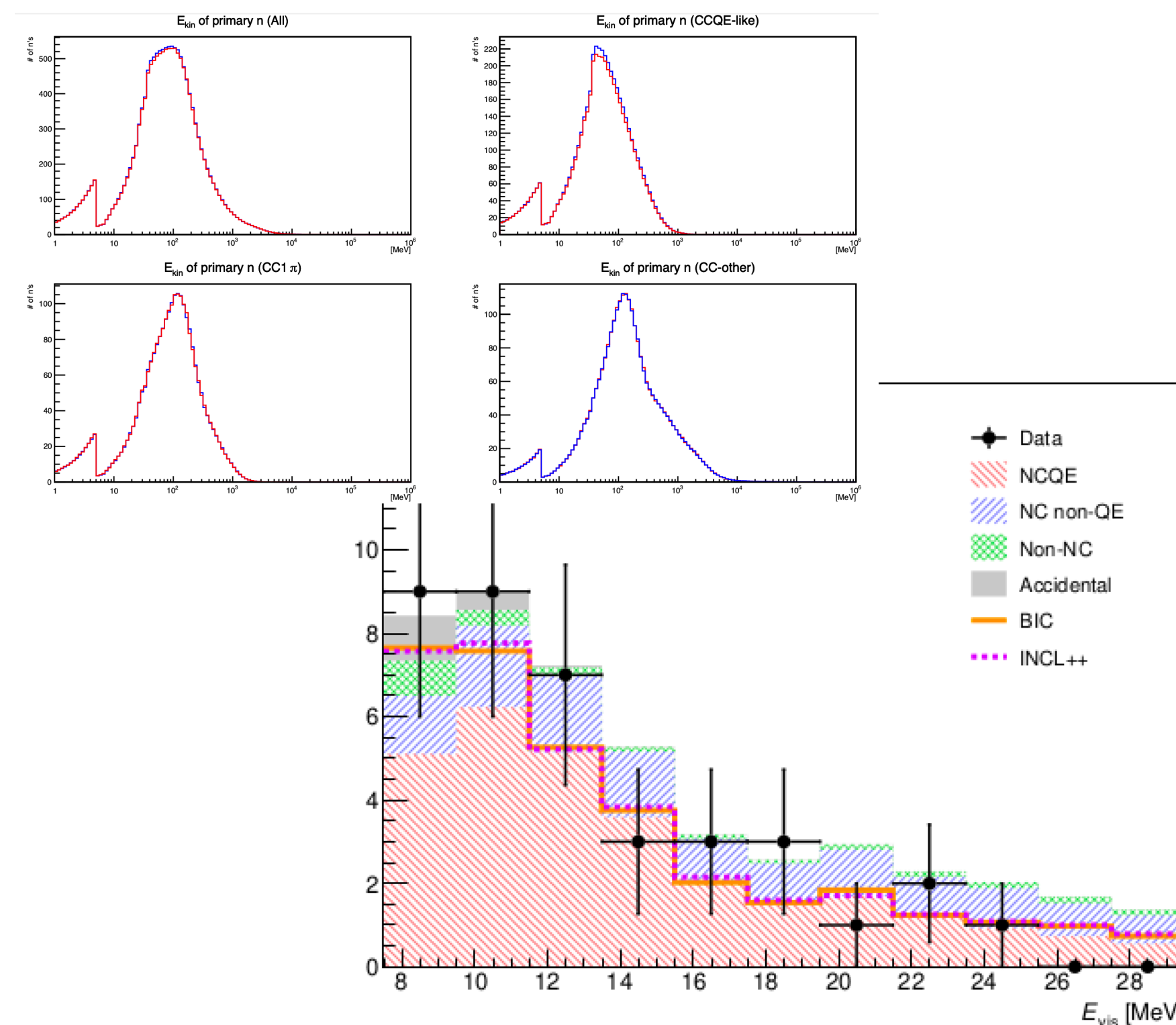
UAM is the only Spanish institution belonging to SK: it is fundamental for SK to continue with the work performs from the UAM and the close collaboration with ICRR colleagues

UAM has been granted with ICRR-IURP projects since 2019:

- ✦ A05, A03: for UAM works on Super-Kamiokande I – VIII
- ✦ B01, B03: for UAM contributions to the construction of the Hyper-Kamiokande experiment

Physics Analysis

- ◆ Comparison NEUT 5.4.0.1 vs NEUT 5.6.4 for SKVI [by Nataly Ospina]
- ◆ Comparison NEUT 5.4.0.1 vs NEUT 5.6.4 for SKVII [by Dustin Samudio]
- ◆ NCQE for SKVI reprocessed data [by Nataly Ospina]



Interaction	Phase	Events	Fraction	Fraction Discrepancy
all	SK-VI	4671565	1.0000 ± 0.0007	0
	SK-VII	3393588	1.0000 ± 0.0008	
ccqelike	SK-VI	1808764	0.3872 ± 0.0003	6.28
	SK-VII	1298998	0.3828 ± 0.0004	
cc1pi	SK-VI	881391	0.1887 ± 0.0002	2.6
	SK-VII	644719	0.1900 ± 0.0003	
ccother	SK-VI	648230	0.1388 ± 0.0002	3.25
	SK-VII	475384	0.1401 ± 0.0002	
nuncqe	SK-VI	539021	0.1154 ± 0.0002	1.5
	SK-VII	393595	0.1160 ± 0.0002	
nubncqe	SK-VI	236743	0.0507 ± 0.0001	1.5
	SK-VII	172924	0.0510 ± 0.0001	
nc1pi	SK-VI	322004	0.0689 ± 0.0001	2
	SK-VII	235182	0.0693 ± 0.0001	
ncother	SK-VI	235412	0.0504 ± 0.0001	2.5
	SK-VII	172786	0.0509 ± 0.0001	
Ratio SK-VI/VII	Normalized to SK-VI		1.0071 ± 0.0007	

Activities

Budget: 290,000 JPY => spent on travel and accommodation at the Kamioka Observatory and the ICRR (Kashiwanoha Campus).

- * [77,800 JPY] Kamioka Observatory: SK training and SK data taking
- * [57,750 JPY] Kamioka Observatory: SK coil repair works
- * [73,500 JPY] Kamioka Observatory: NCQE analysis and UDEAL maintenance
- * [80,950 JPY] ICRR (Kashiwa): NEUT analysis

