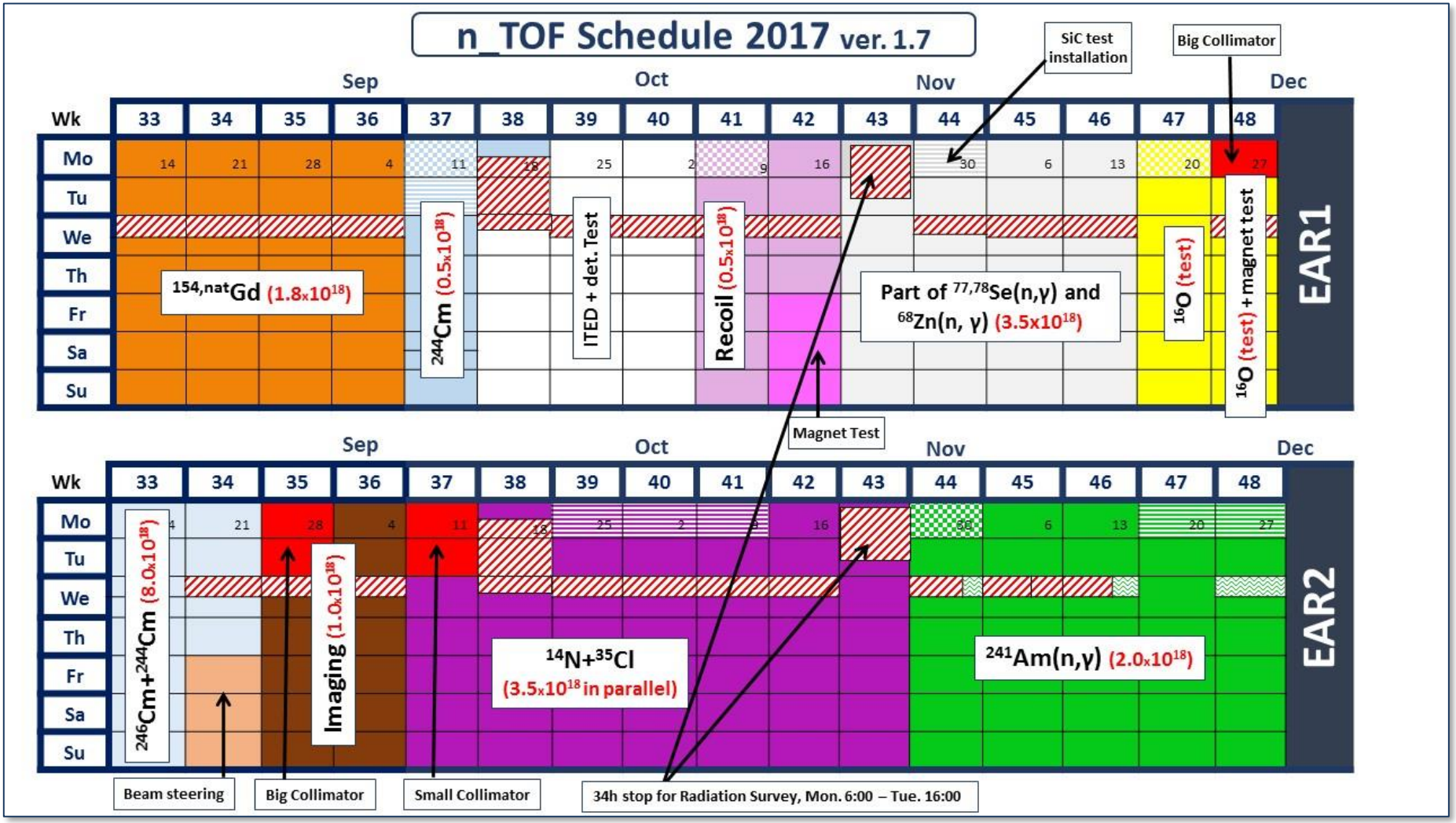
n_TOF Report

Daniela Macina
n_TOF Run Coordinator
CERN

OUTLINE

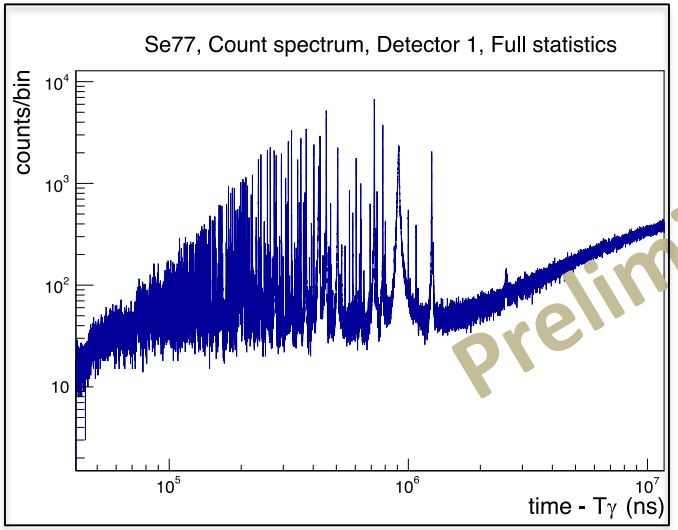
- Last experiments in 2017
- n_TOF safety: news
- Operation in 2018
- Draft planning 2018
- Conclusions

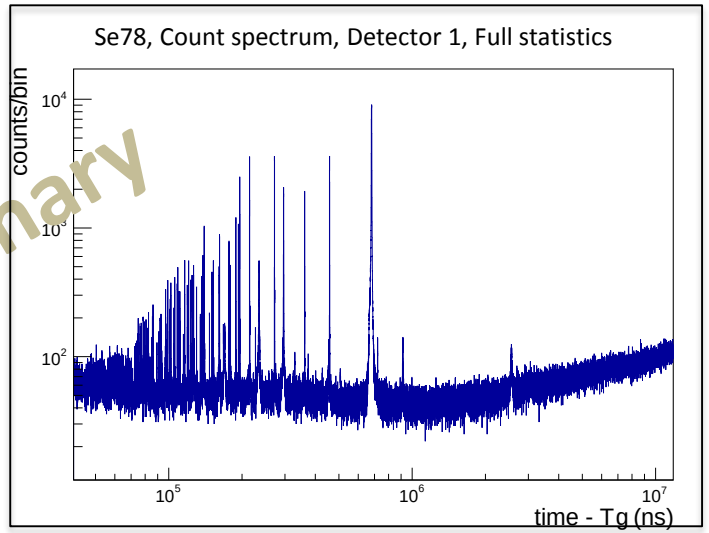
Measurements: last part 2017



^{77,78}Se(n,γ) (and ^{68}Zn(n,γ))

- ^{77}Se, ^{78}Se & ^{68}Zn abundances produced in massive stars are most sensitive to nuclear reaction rate uncertainties of ^{77}Se(n,γ)^{78}Se, ^{78}Se(n,γ)^{79}Se, and ^{68}Zn(n,γ)^{69}Zn.
- Big uncertainties and discrepancies (10-50%) in the previous measurements of these reactions
- ^{77}Se and ^{78}Se successfully measured in autumn 2017, remaining beam time planned in 2018.



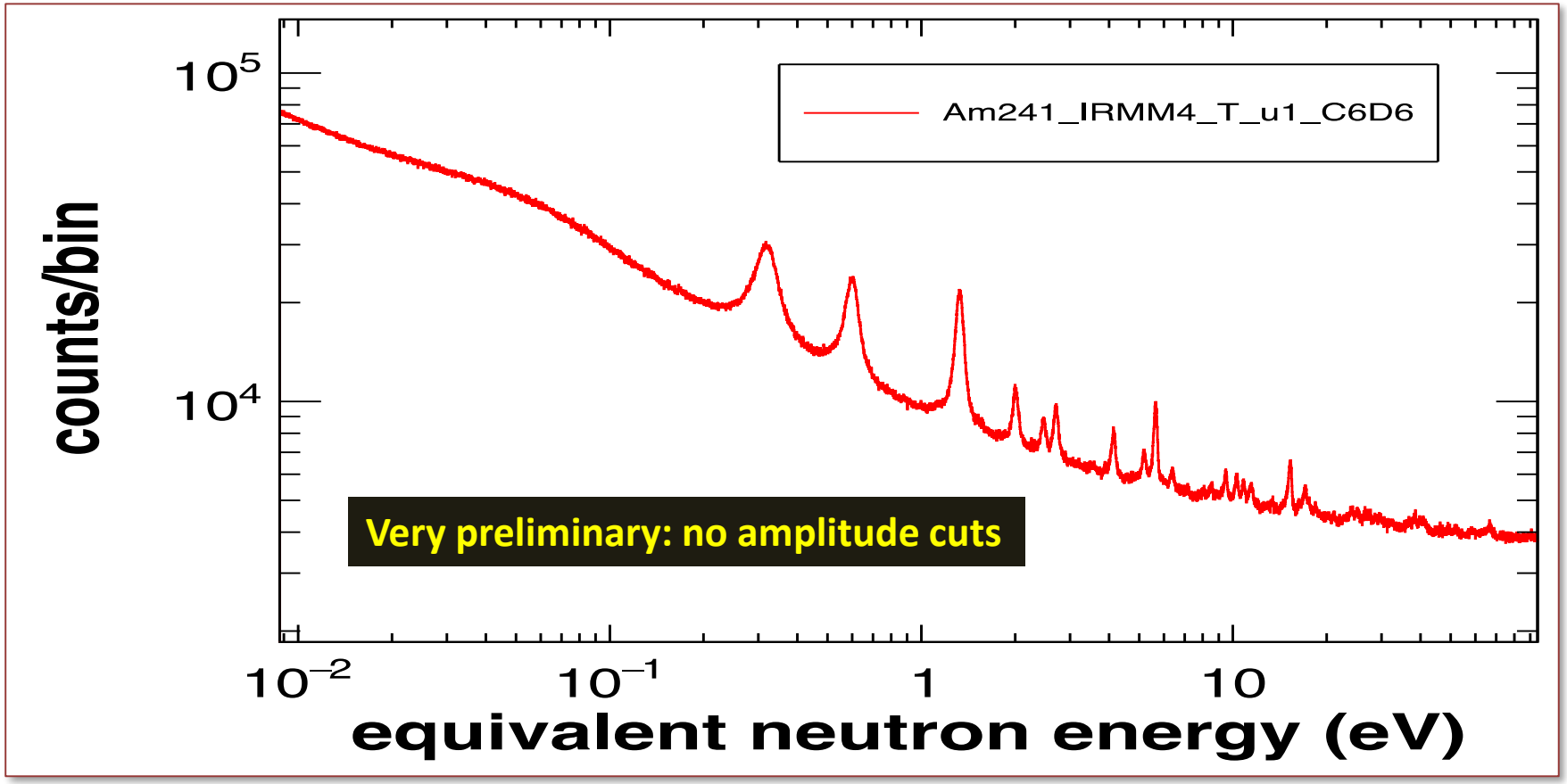


Preliminary

^{241}Am(n,γ)

Motivation: re-measure the sample already measured in EAR1 in 2010 to:

- **Fully cover the thermal region (extended DAQ time-range)**
- **Highly improve the signal to (radioactive) noise ratio (EAR2 vs EAR1)**



EAR1 Sweeping Magnet test

- EAR1 Sweeping magnet is a very old dipole and makes use of a DC power supply
- In the frame of the East area renovation, a study is being done to replace all DC power supplies by cycled power supplies for energy savings.
- Based on the EAR2 experience, we are investigating the possibility to replace the EAR1 magnet with a permanent one.

Several advantages

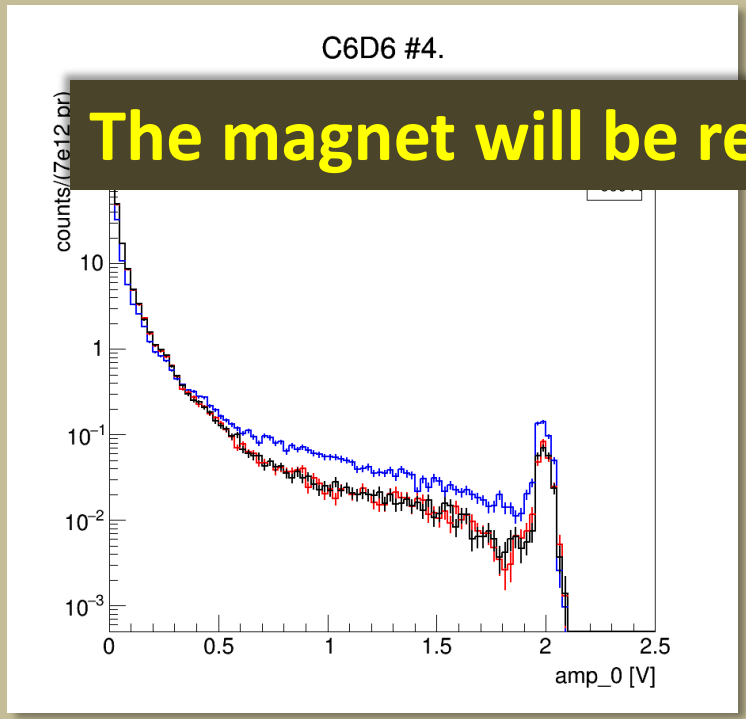
- **No power supply needed**
- **No external network such as electrical cabling and demineralized water.**
- **No operational cost.**
- **New magnet**

The actual design studies are based on a permanent magnet field of 0.6 Tm

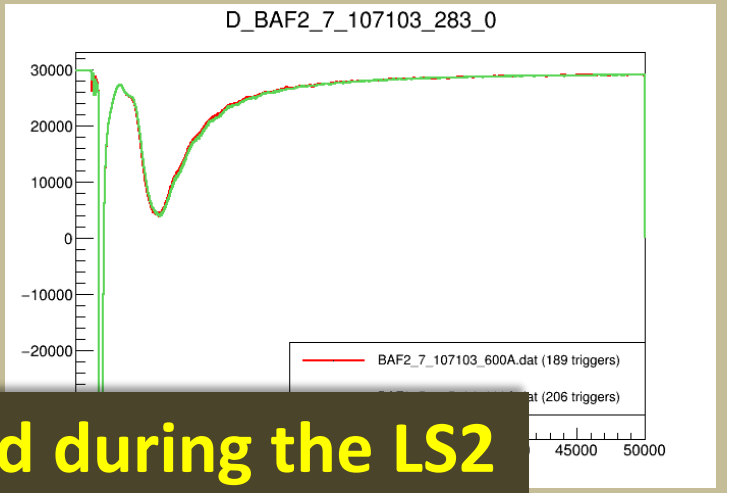
EAR1 Sweeping Magnet test (cont)

- FLUKA simulations including the whole beam line and the response from different detectors show that a magnet field of 0.6 Tm is perfectly ok.
- We have performed tests at 0, 0.6, 1.2 Tm with a number of detectors and validated the simulation results

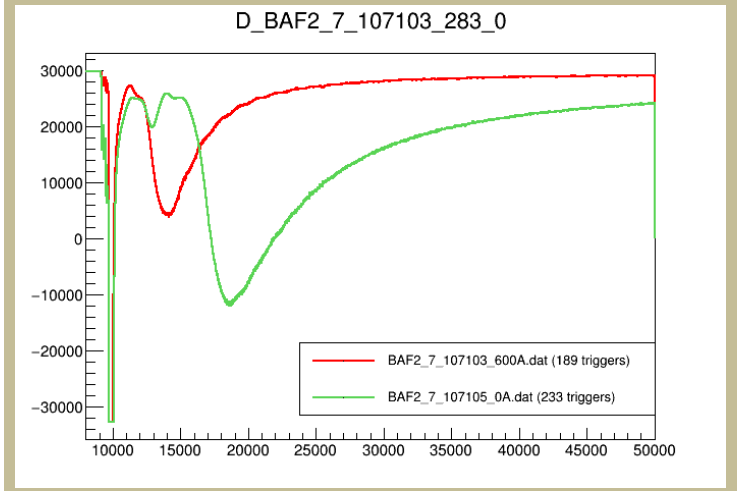
Effect on the noise



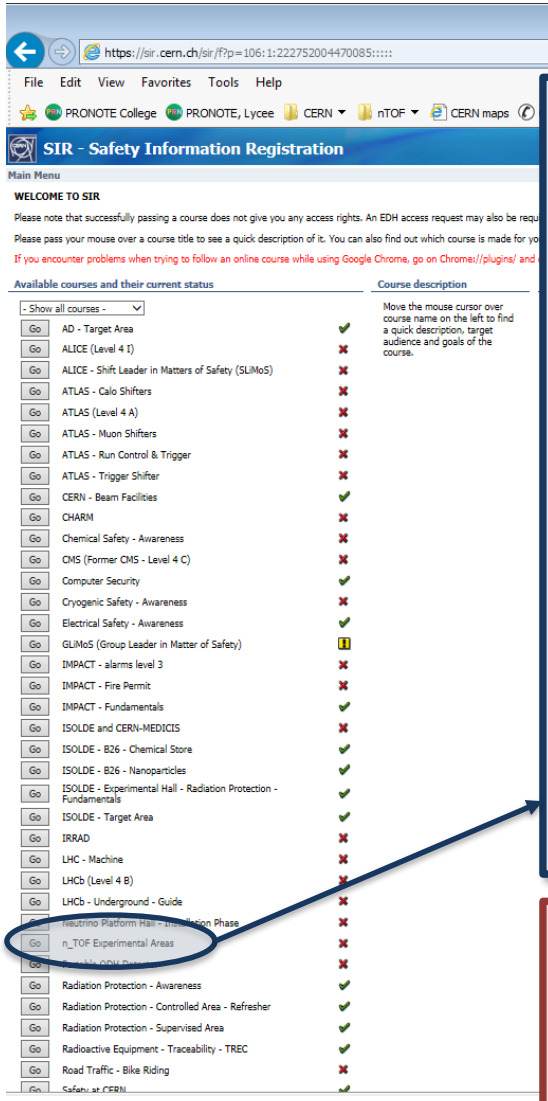
Effect on the G-flash



The magnet will be replaced during the LS2



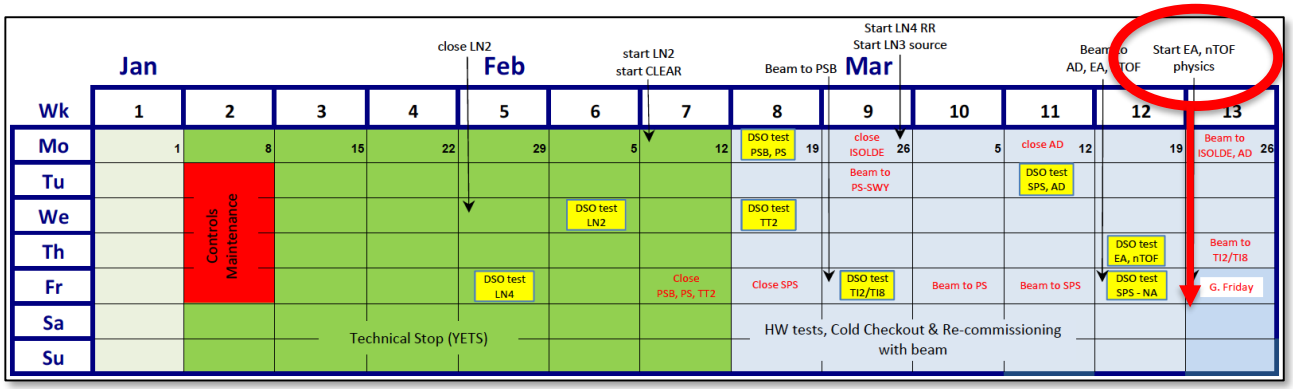
n_TOF Safety News

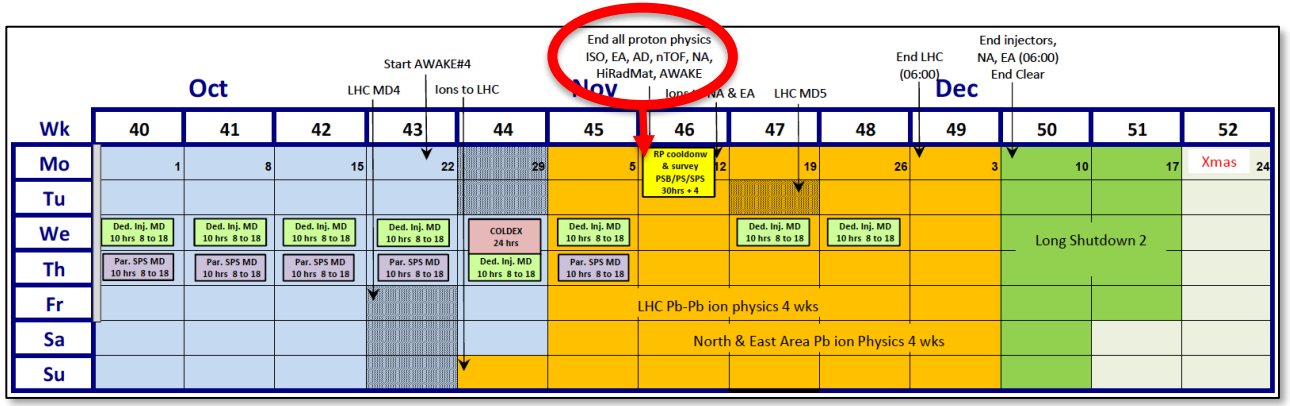


- As of December 2017 the new online course "**n_TOF Experimental Areas**" is available on CERN's application SIR
- This online course is provided for people who need to access the n_TOF experimental areas. The aim of this course is to present the hazards and risks existing in the n_TOF facility, the responsibilities and expected behaviour of everyone accessing the area and the right behaviour in the event of an emergency.
- From March 1st 2018, onwards this new online course will be mandatory for people accessing the n_TOF areas "ntof-exp".

As of start of operation in 2018, the RP group will organise a 30 minutes practical n_TOF course for each team responsible for the installation and operation of an experiment

n_TOF operation in 2018





32 weeks of operation

Extrapolation from 2017 => P.O.T. ~ 2.2 x 10^{19} (to be confirmed by the PS)

Draft Planning 2018 EAR1

Proposal	INTC	Comment	Status
^{68}Zn (n,g) (cont. from 2017)	INTC-P-509	Astrophysics	Approved
^{12}C(n,p)	INTC-P-488	Basic nuclear physics	Approved
^{230}Th(n,f)	INTC-P-493	Basic nuclear physics & nuclear technologies	Approved
^{235}U(n,f)	INTC-P-507	Basic nuclear physics	Approved

Draft Planning 2018 EAR2

Proposal	INTC	Comment	Status
^{231}Pa(n,f)	INTC-P-513	Nuclear technologies	Approved
^{241}Am(n,f)	INTC-P-492	Nuclear technologies	Approved
^{230}Th(n,f)	INTC-P-493	Basic nuclear physics & nuclear technologies	Approved
^{53}Mn(n,g)	INTC-P-408	Basic nuclear physics & Astrophysics	Approved

Summary and conclusions

- Data analysis going on the experiments performed in 2017
- Shutdown activities: standard maintenance activities -> well on track to be ready for the 2018 start-up
- New Safety Course to access the n_TOF experimental areas
- Quite a number of experiments to be planned and performed before the LS2