Status of the R.A. budget for the plan C (prepared with NeuCBOT and SaG4n)

Maxim Gromov (SINP MSU, JINR), Vicente Pesudo (CIEMAT)

DS-mat working group meeting
28.05.2021

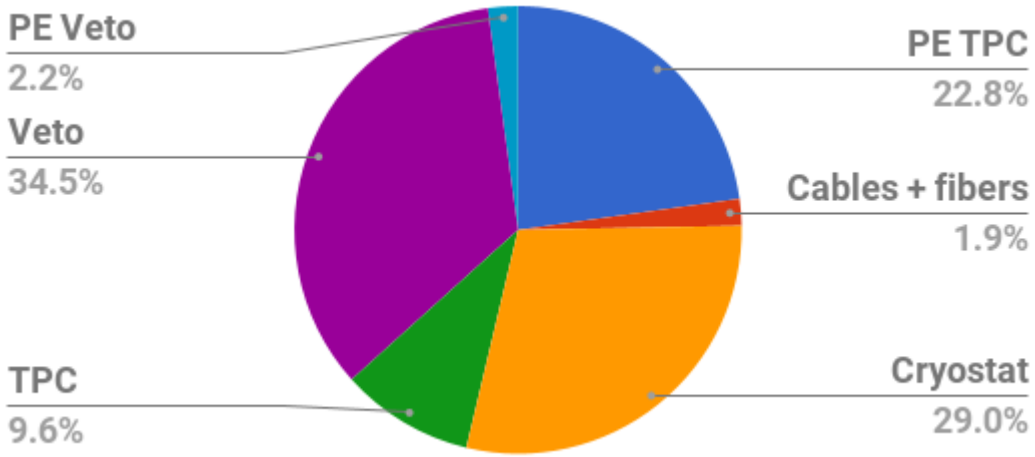
General overview

Original goal for all types of backgrounds: **0.1 NR after cuts in 200 t y**

Plan C

Not ready yet,
Work in progress

Plan C



NeuCBOT with TENDL2019 (with TALYS-1.95):
--- NR after cuts in 200 t y

SaG4n with JENDL-TENDL2017:
0.095 NR after cuts in 200 t y
Reduction by ---% with respect to the R.A. budget based on NeuCBOT+TENDL2019 (TALYS-1.95)

To be updated soon:
- numbers of PDMs and TIAs

Most contributing materials for the Plan C

	NeuCBOT + TENDL2019 (TALYS-1.95)		SaG4n + JENDL-TENDL2017	
1		%	Acrylic Donchamp	16.56%
2		%	Gd2O3 Shin-etsu on Acrylic	14.27%
3		%	RPUF EA	12.83%
4		%	Rigid EA	9.34%
5		%	resistor	8.84%
6		%	Finished Arlon 55NT PCB	4.81%
7		%	SS grid frame	4.48%
8		%	flexible EA	3.30%
9		%	Gd2O3 Shin-etsu	3.19%
10		%	Acrylic Donchamp from JUNO	2.65%
11		%	LED (op. driver)	2.39%
12	REST	%	**REST**	**17.34%**

Quite similar sets of the most contributing materials

Legend:

	same position
	in both lists
	only in one list

Outcomes

1) The total budget with **NeuCBOT and TALYS-1.6** is
0.160 NR after cuts in 200 t y for the plan C

The total budget with **SaG4n and JENDL-TENDL2017** is
0.095 NR after cuts in 200 t y for the plan C
The respective reduction is about ---%

2) Quite similar sets of the most contributing materials

3) The comparison between the budgets which are based on
NeuCBOT with the **TENDL2019** library (**TALYS-1.95**) and
SaG4n with the **JENDL-TENDL2017** library
will be done soon

Outcomes

4) Automatic recalculation in all the budgets
when changing the masses of materials, activities and inefficiencies

5) A link to the new neutron budgets

with NeuCBOT and TENDL2015 (TALYS-1.6):
neutron_bg_Apr21_PlanC ⇐

As of now,
this is the only place
where the masses,
activities and inefficiencies
can be changed

with NeuCBOT and TENDL2019 (TALYS-1.95):
neutron_bg_Apr21_PlanC_with_NeuCBOT+TALYS-1.95_28-05-2021

with SaG4n and TENDL2017:
neutron_bg_Apr21_PlanC_with_SaG4n_copy_28-05-2021

Backup slides

Tools

NeuCBOT

with the **TENDL2019** library of
the (α,n) cross sections
(based on with TALYS-1.95)
Author: Shawn Westerdale
Links: article, code

Features:

- Fast calculations
(but without propagation of particles
in the specified medium)

- relies only on theoretical calculations
performed with the TALYS code

SaG4n 1.1

with the **JENDL-TENDL2017** library of
the (α,n) cross sections and
the secondary neutron energy-angular distribution data
Authors: the **CIEMAT** group, namely
Emilio Mendoza, Daniel Cano-Ott,
Vicente Pesudo, Roberto Santorelli
Links: article, code

Features:

- based on Geant4
(propagation of particles in the specified medium)

- relies on available experimental data and
theoretical calculations