

## **Some Concluding Remarks**

### **Workshop "Town Meeting on the IFMIF/ELAMAT Scientific Program"**

April 14-15, 2016, hosted by the Rzeszow University of Technology, Poland

The meeting have had a very good start  
Raise interest at the political level , both national  
(ministry ) and regional (including our host  
Rzeszow University of Technology)

**It is a first success!!**

All known large scale research infrastructure have  
had a tremendous impact in the education ,culture  
science and economy of the host counry and even  
More a hudge regional impact  
<http://elamatscience.ifj.edu.pl>



## Main goal: The White Book

- The conclusions of this Workshop (talks and discussions) will identify the most promising science projects that could be developed at IFMIF-DONES without compromising its main role.
- As a next step, a White Book on „IFMIF/ELAMAT Complementary Scientific Program” will be prepared by the Scientific Committee, with the leading role of the Conveners and Speakers of the Workshop



White Book report on  
„IFMIF-DONES for isotope production, nuclear  
physics, materials science and other applications”

The 2014 EU Roadmap concluded that DEMO requirements can be fulfilled with a smaller neutron source



## IFMIF-DONES (Demo-Oriented Neutron Source)

### Main technical characteristics

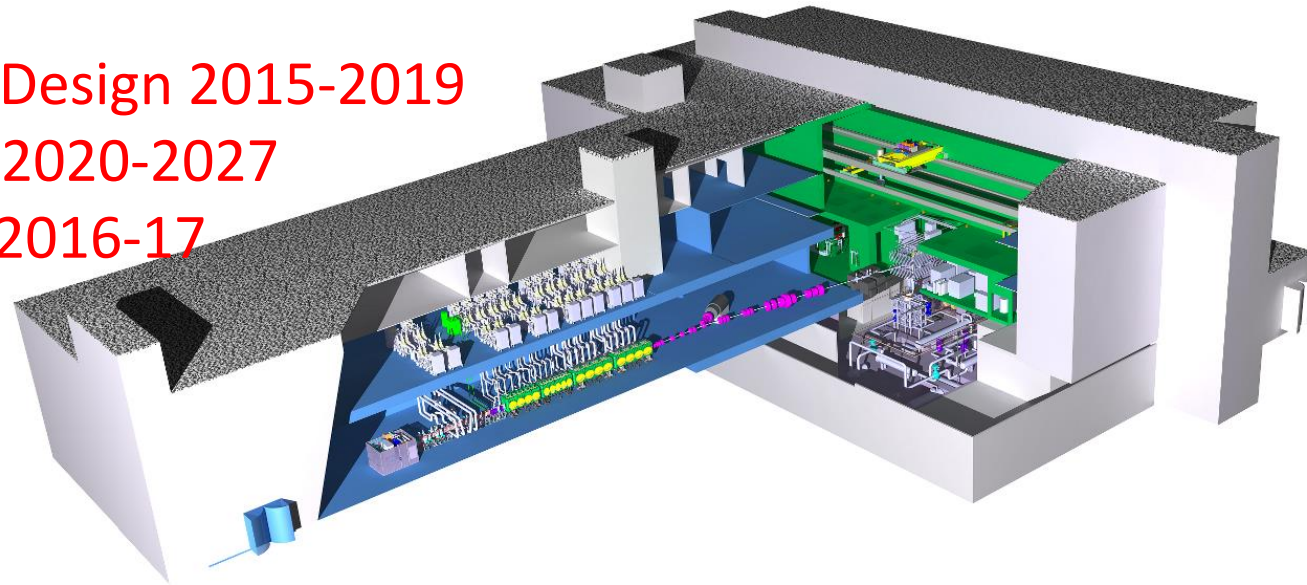
Based on IFMIF Preliminary Engineering Design...

- One full energy (40 MeV) accelerator with angular incidence
- Full size IFMIF Test Cell, Full size IFMIF Li loop:
- Waste management reduced to the minimum: **all wastes transferred in casks to external facilities**

Target dates Design 2015-2019

Construction 2020-2027

Site decision 2016-17



To answer the question:

- **Can IFMIF-DONES be used for other science and/or technology applications?**
- **If so, develop science case and main requirements**

preliminary decision on additional objectives to be included in IFMIF-DONES engineering design will be taken by **mid-2016**

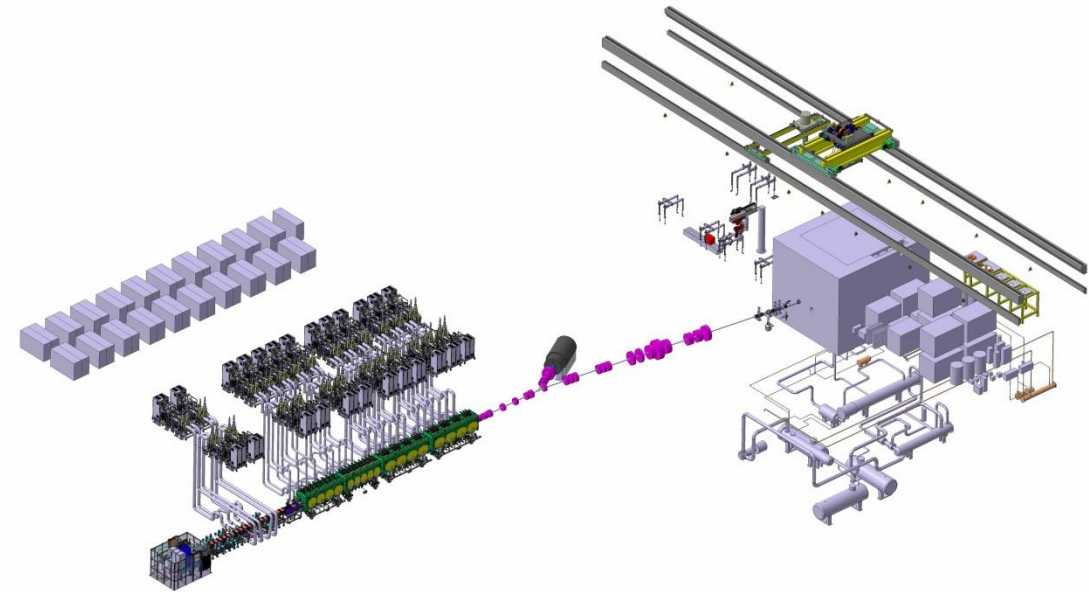
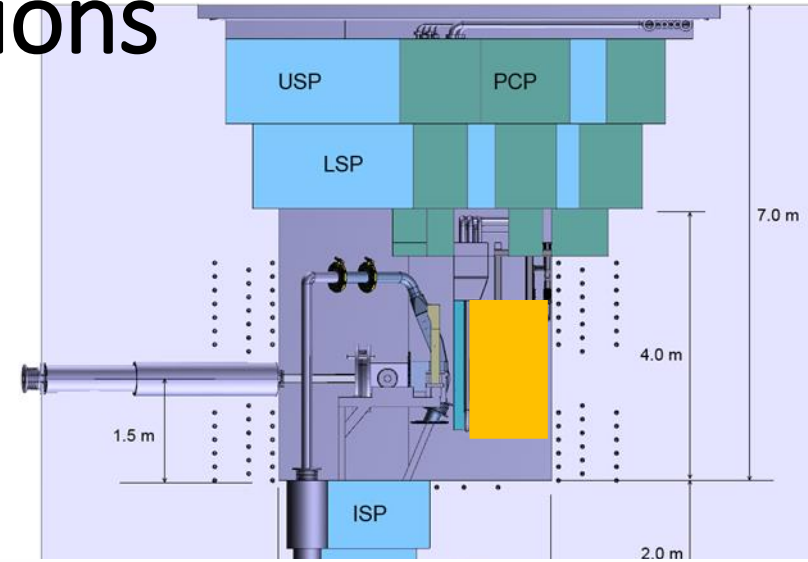
# Boundary conditions for new applications

**Main IFMIF-DONES mission: irradiation of fusion materials**

They requires several years of continuous irradiation.

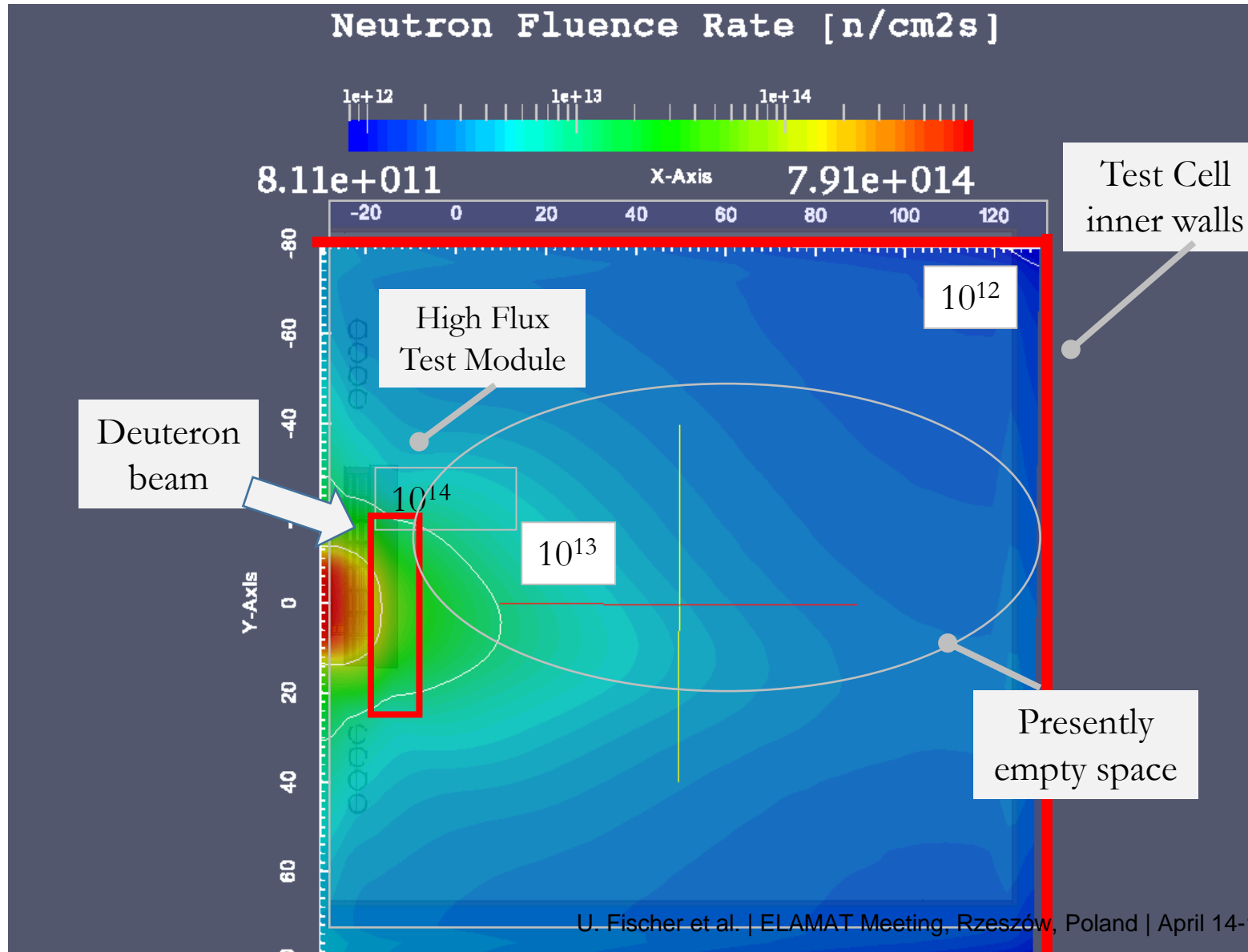
So, complementary applications can use:

- 1) ***Neutrons and photons high flux available behind Irradiation Module either inside Test Cell or in a new additional Experimental Hall***
- 2) Deuterons can be extracted from the accelerator beam but in **a very small fraction (a few percent, 40MeV, 5-10 mA)**



# Important parameters for Complementary science case

DONES  
Test Cell –  
Neutron flux map

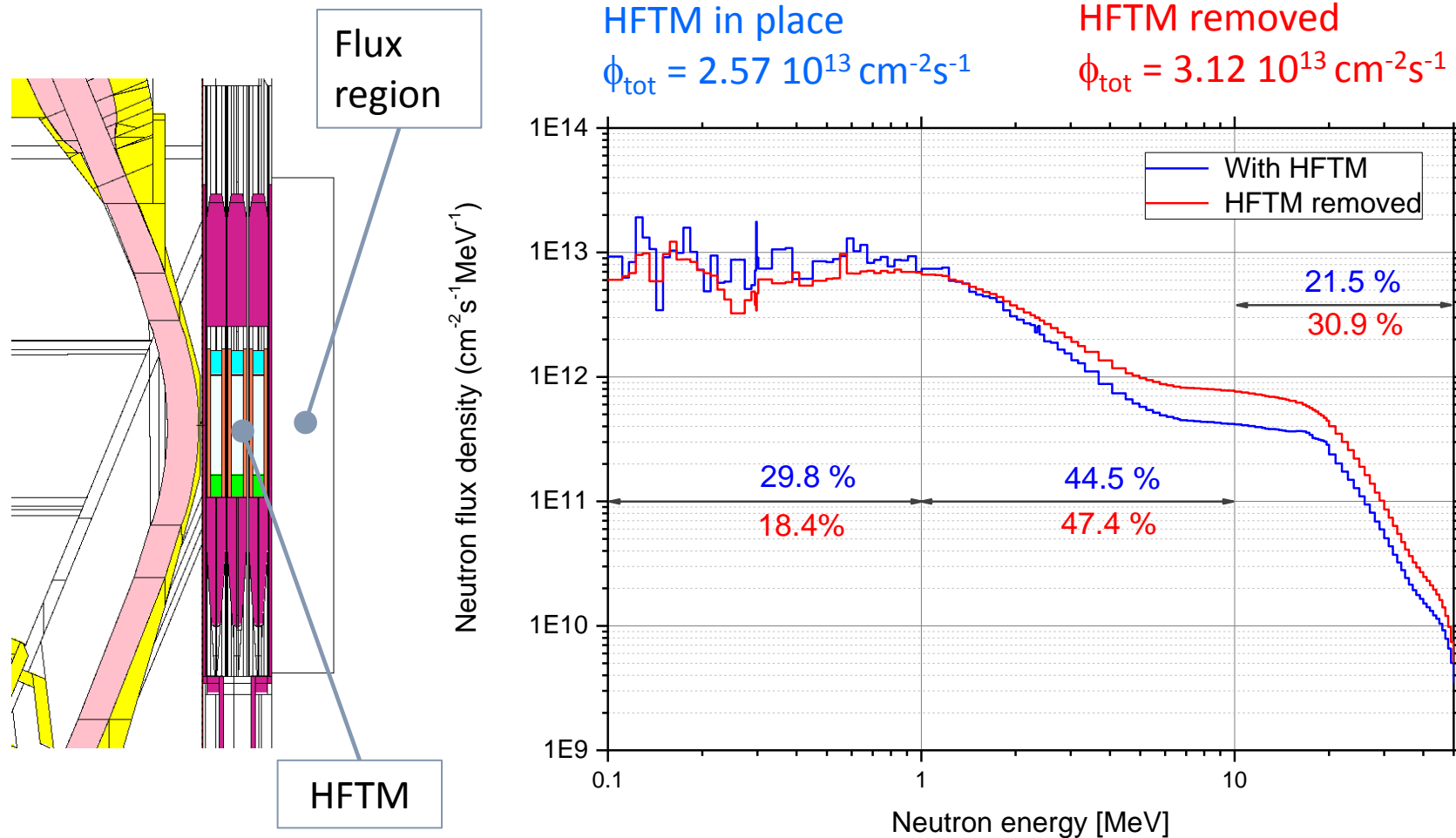


Also see photon  
flux map



# DONES Neutron Flux Spectrum

Flux region behind HFTM with HFTM in place and HFTM removed



# Complementary Science possibilities

Implementations at least three different schemes corresponding to different needs :in first very rough approximation

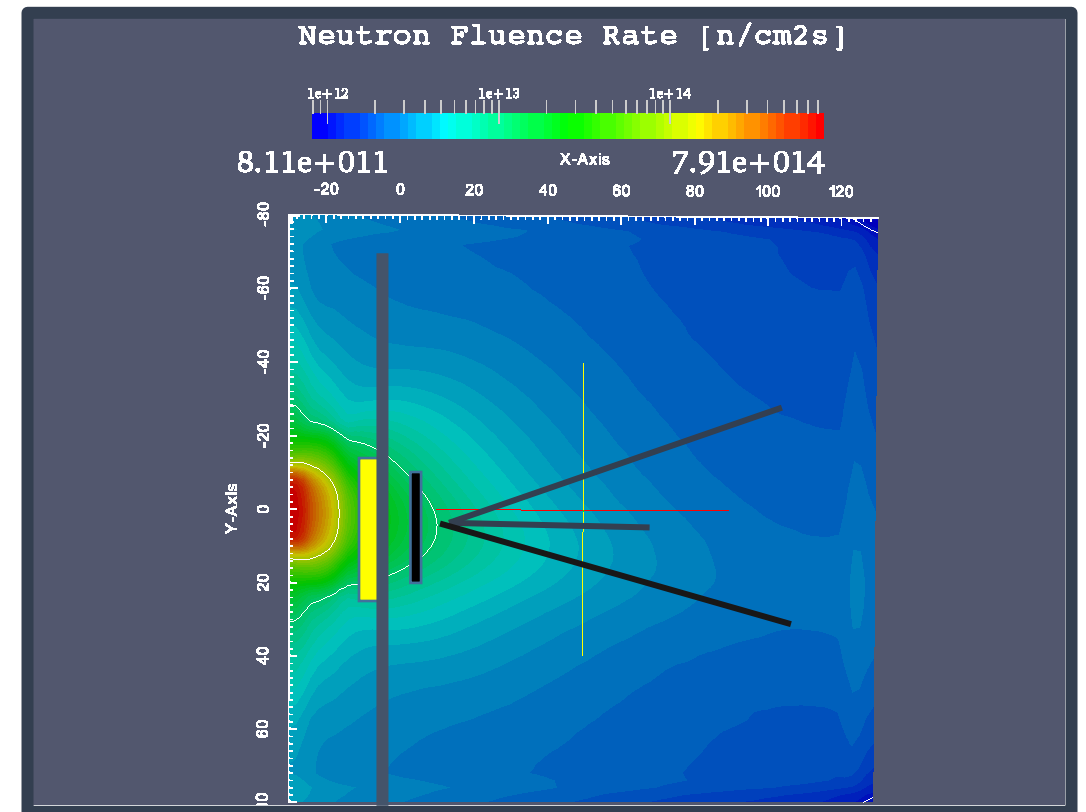
**D Beam splitting few % :new beam line , new target + Expts apparatus where and how ??**

**After Irradiation cell , secondary target with rabbit to extract after planned irradiation time (days ,months) sample production**

**Or Moderator after main irradiation cell ??**

**After irradiation cell , neutron beam lines for dedicated science cases**

**And , or .....**





***Quite a few complementary Science cases were presented ---***

Radio-isotopes production , medical application , neutron science , NP & RIB facility , New isomers, n-Fission , n for astrophysics , neutrinos, n –solid state physics, applications (tomography, damage , doping ,etc....)

**To be transformed in a comprehensive white book**

Each speaker is invited to produce 1 to 2 pages contribution where the following items should be discussed

\*advantages and/or uniqueness of IFMIF –ELAMAT versus ILL , ESS, NFS ,and others neutron sources

\*possible first ideas of implementation related to the needed flux and energy range , very preliminary ideas of the size and volume of main components of the experimental set up WITHOUT DISTURBING (too much) THE MAIN IRRADIATION CELL

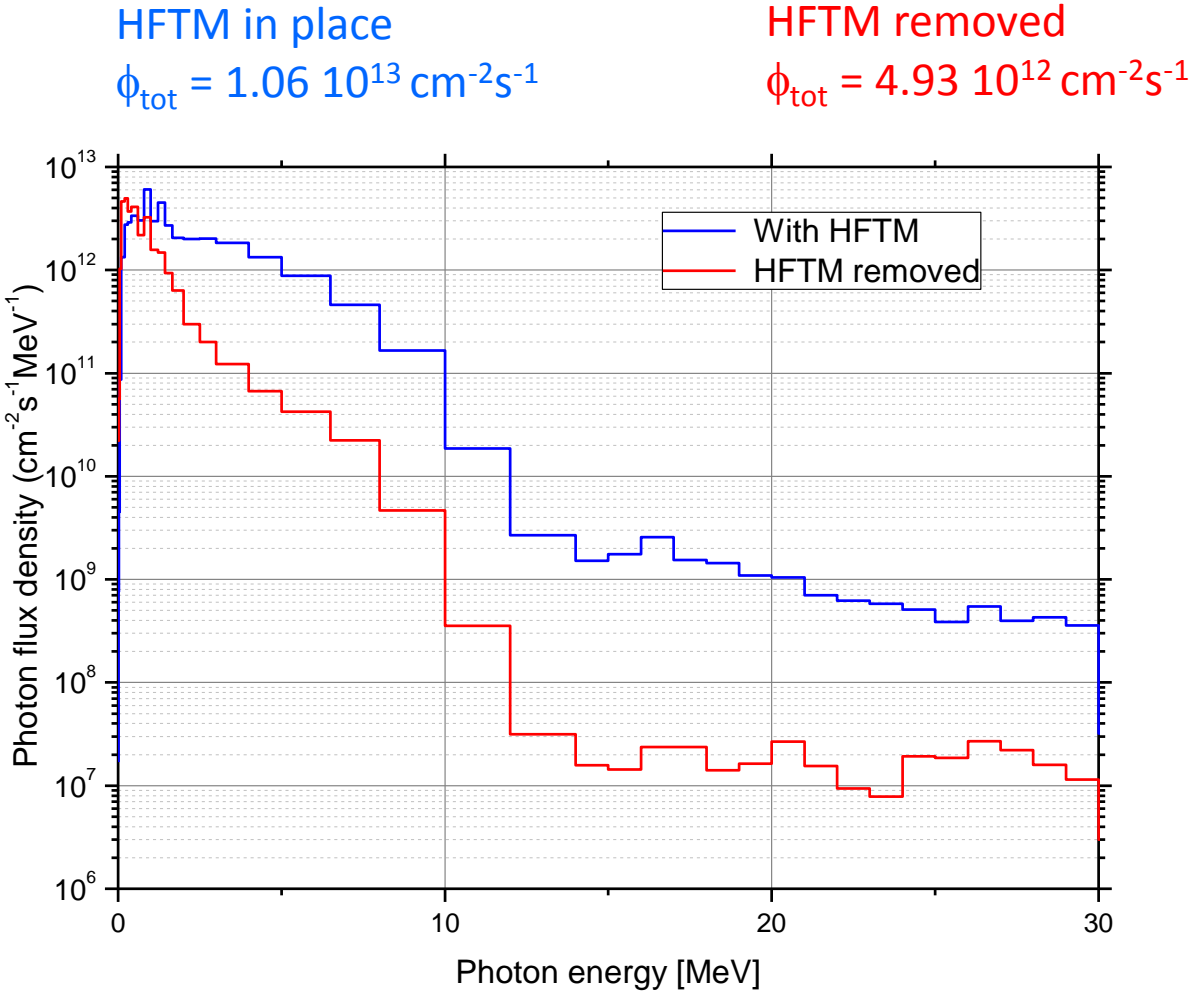
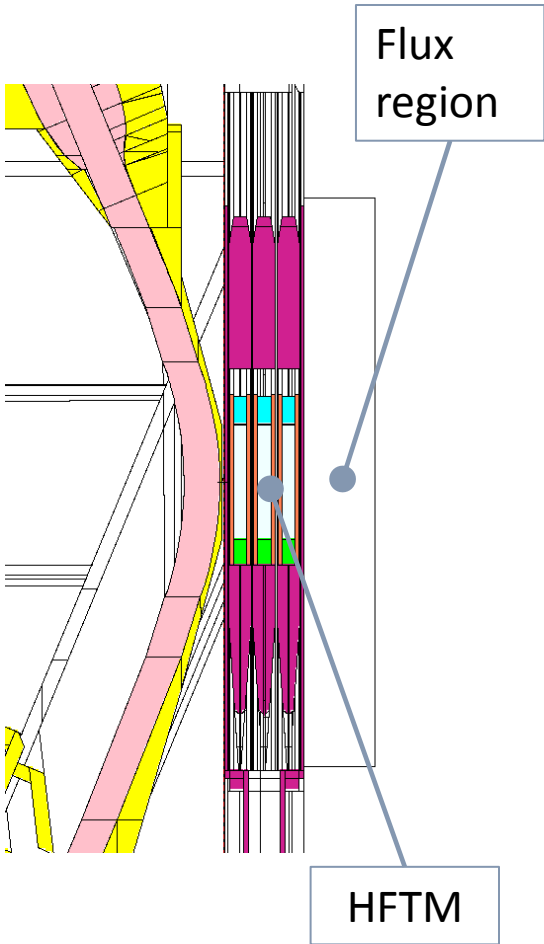
***White book has to be submitted by May !!***



- So to conclude very exciting new prospects has been discussed as complementary science components .
- To be integrated in the main priority scheme of irradiation material for fusion

Preparing this white book is now the important milestone and we hope that with your help and expertise we will be able to continue building the science and technical case of IFMIF/ELAMAT.

# DONES Photon Flux Spectrum



# DONES test Cell = Photon flux map

