

Dosimetry Laboratory
Approach and *Challenges*



Capabilities & Responsabilities

	PASIVE DETECTORS	ACITIVE DETECTORS
X & γ radiation →	BeOSL system	NAUSICAA SATURN 5702
Neutron radiation →	TASL system	BONNER SPHERES System

- Radiation monitoring program
- Complying radiation protection and dosimetry legal requirements and limits
- OEW and environment dosimetric monitoring;
- Devices testing and experimental campaigns;
- Method and material testing and validation;

X & γ radiation



What we have:

1)BeOSL - > Dose measurement range : 50μSv-10 Sv;
Energy range : 16 keV-10 MeV;

2)NAUSICAA -> Dose measurement range:
- 10 nSv/h ÷ 10 Sv/h (standard version);
- 10 nSv/h ÷ 100 mSv/h (-PF pulsed field version);
-> Energy range: 30 keV ÷ 10 MeV;

3)GIM 204K -> Energy range: 60 keV to 3 MeV;
->Dose measurement range: 0.01 μSv - 0.1 Sv/h;

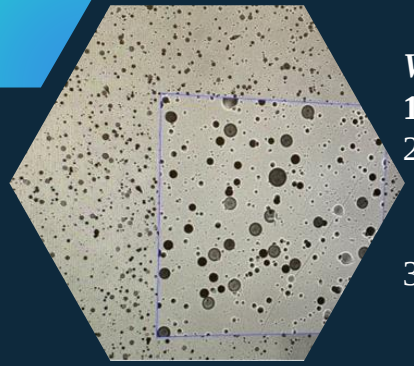




What we need acc. to ELI-NP's fields characteristics:
-Energy: 10 keV – 300 MeV;
-Dose rate range: 10^{-7} – 10^{-2} Sv/h
(dose per pulse: 1 μSv) ;



Neutron radiation



What we have:

1)TASL System (PADC) 100/200 keV to 14 MeV;

2)**Bonner Spheres**

- 40 to 500 ns length pulses;
- Energy range: thermal – GeV;

3)**SATURN 5702** (neutron radiation unit) - LUPIN BF3-NP

-Energy range: thermal (0.025 eV) ÷ 10 GeV;

-Measurement range: 10 nSv/h ÷ 100 mSv/h;

-for PF - 1 µSv for pulses <100ns;

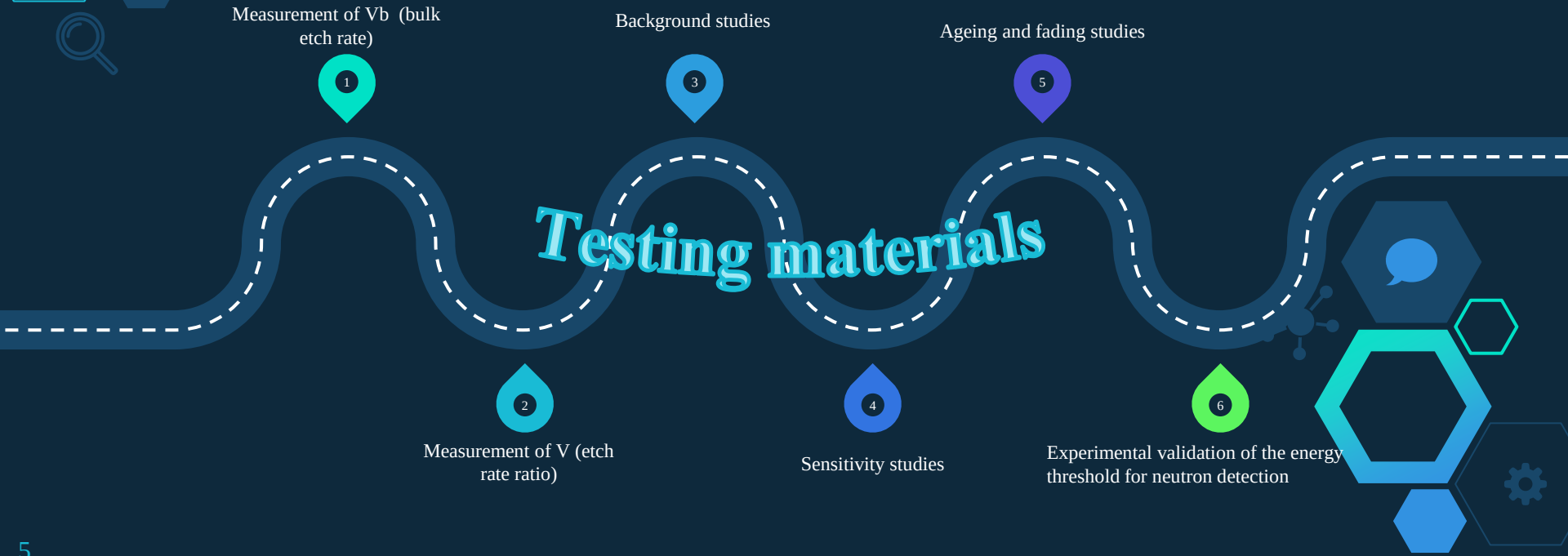


What we need :

1) A globally standardized SSNDT method: MATERIAL and ETHCING RECIPE;
2) High energy detection limit (up to 1GeV, ns lenght pulses)
3) Specific upgraded software (e.g. tracks dimensions filters);
4) Standard unfolding method for BSS;



Roadmap for SSNDT method
(CR-39 Quality Task – EURADOS WG2)



Solutions

-Continuous tests on methods and materials in the scope of obtaining a standardised method;

-Continuous colaboration within the international scientific world to share knowledge related to technical aspects and harmonisation of individual monitoring systems;

-A complex system of active, pasive detectors and MCNP/Flukka Simulations;





THANK YOU FOR YOUR ATTENTION!

