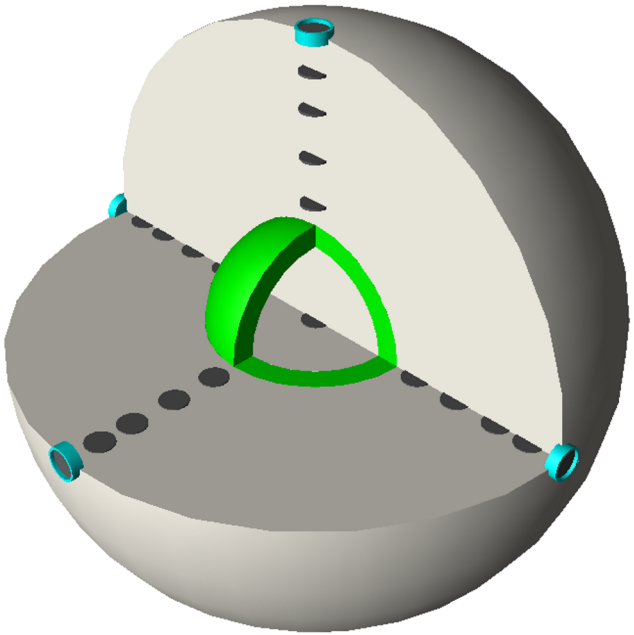
NESCOFI@BTF

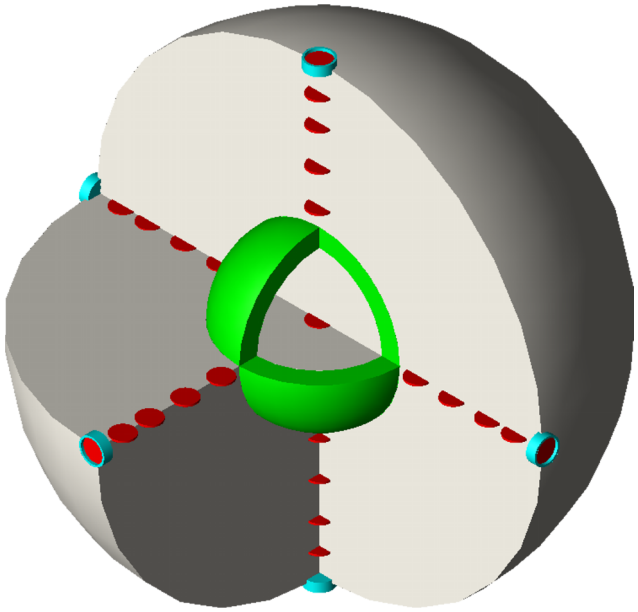
Reunione di fine primo anno

SP^2: dalle simulazioni allo strumento

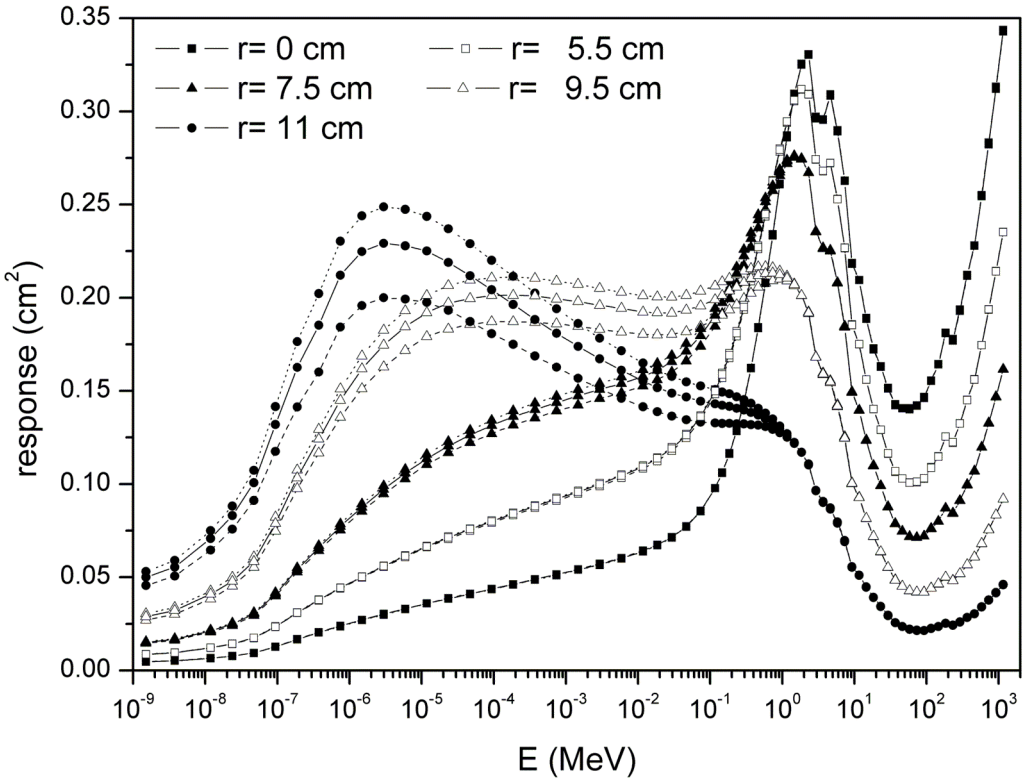
1) Il disegno finale
2) Numero e posizione dei rivelatori
3) Anisotropia e neutroni di bassa energia
4) Neutroni di alta energia

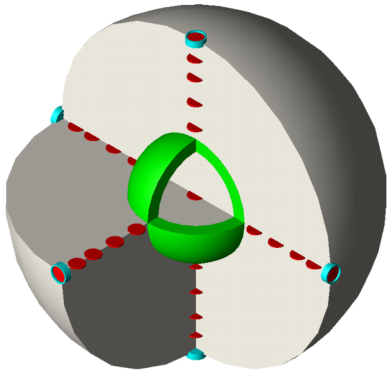
1) Il disegno finale





2) Numero e posizione dei rivelatori



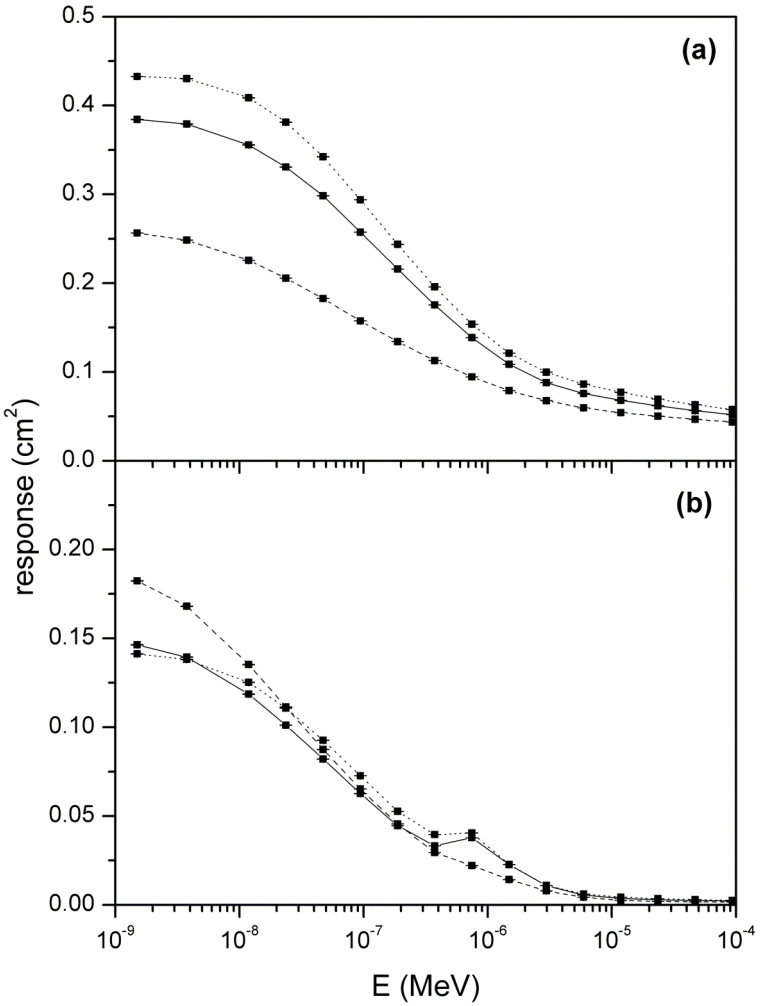


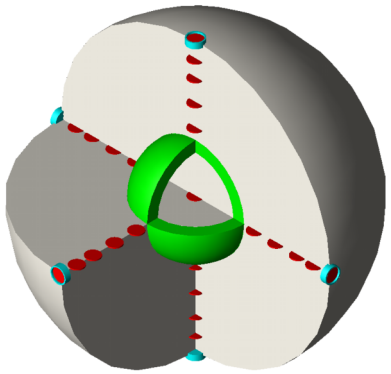
The response functions have been calculated for radial distances 0, 5.5, 7.5, 9.5, 11 cm.

Energy response functions to monoenergetic incident neutrons, averaged over the detectors located at the same distance from the center, for three different irradiation geometries:

- along the (1 0 0) axis (dashed lines),
- isotropic (continuous lines)
- along the (1 1 1) axis (dotted lines)

3) Anisotropia e neutroni di bassa energia



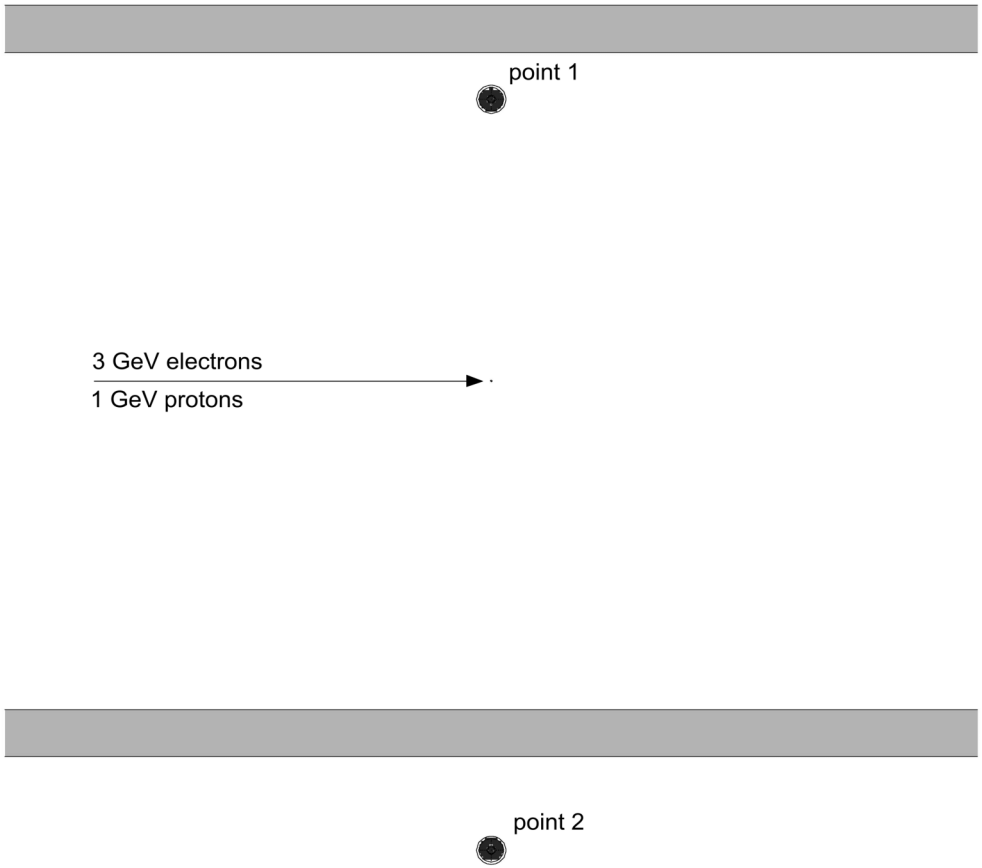


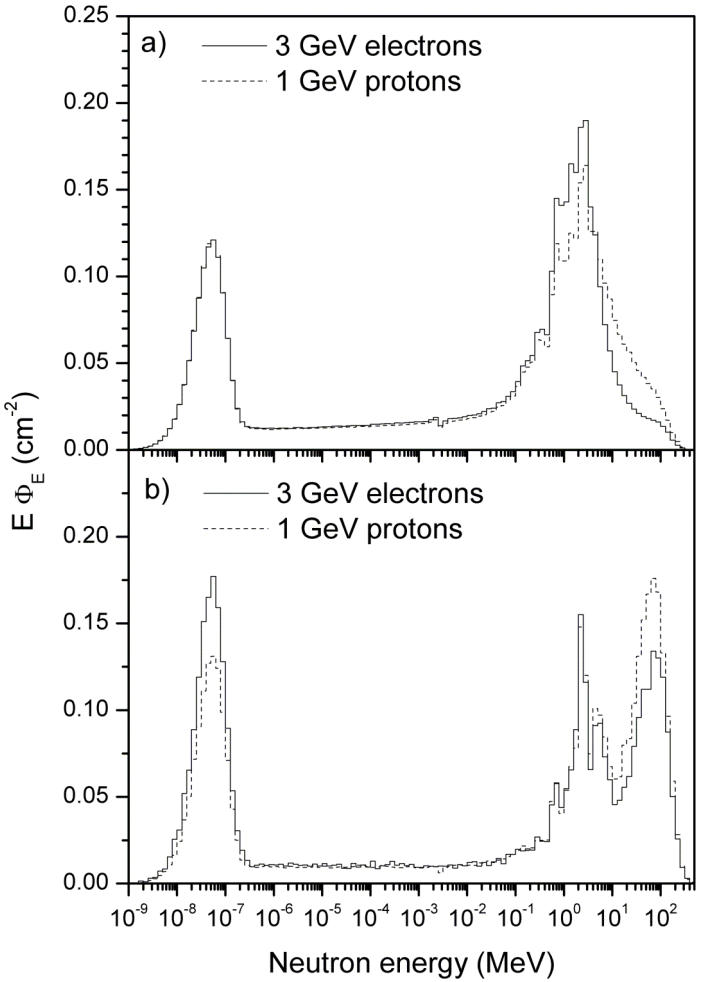
Energy response function to monoenergetic incident neutrons, averaged over the detectors located on the surface of the sphere, for three different irradiation geometries:

- along the (1 0 0) axis (dashed lines)
- isotropic (continuous lines)
- along the (1 1 1) axis (dotted lines)

a) withouht cadmium layer
b) with cadmium layer

4) Neutroni di alta energia (simulazioni)

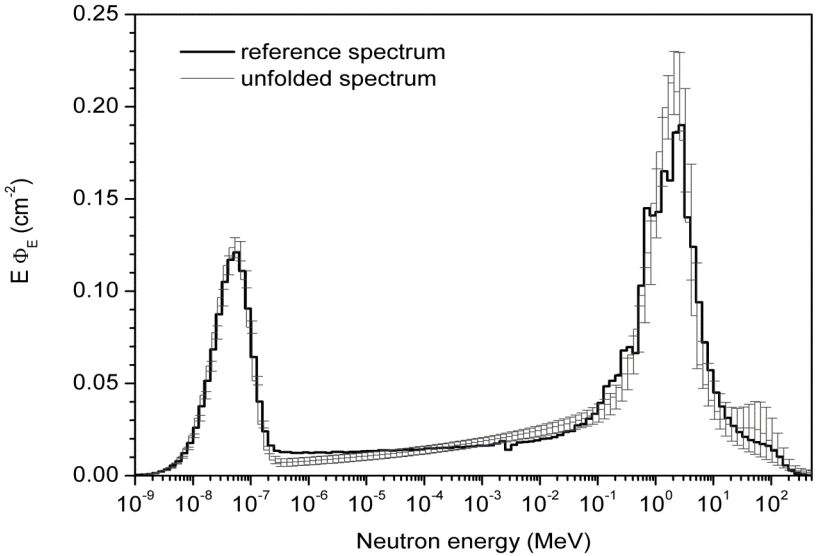




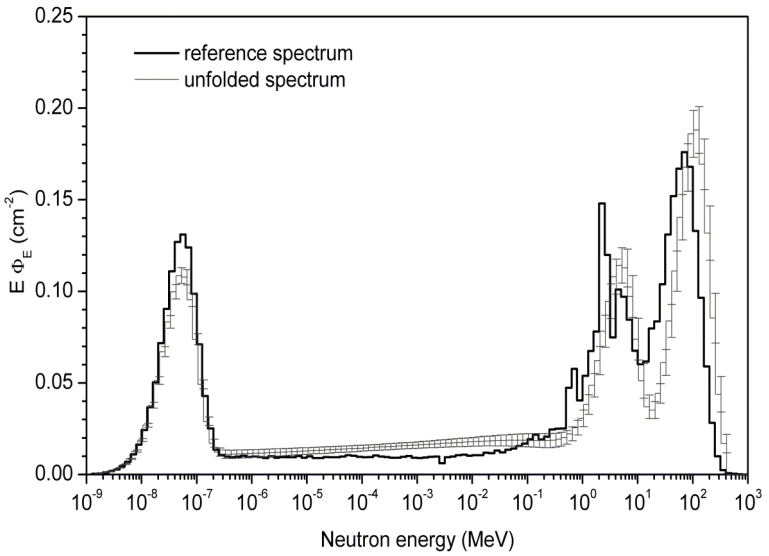
LEFT: Schematic view of the geometry used to simulate the exposure to high energy neutron field

RIGHT: Simulated high energy neutron spectra calculated according to the geometry depicted

4) Neutroni di alta energia (simulazioni)

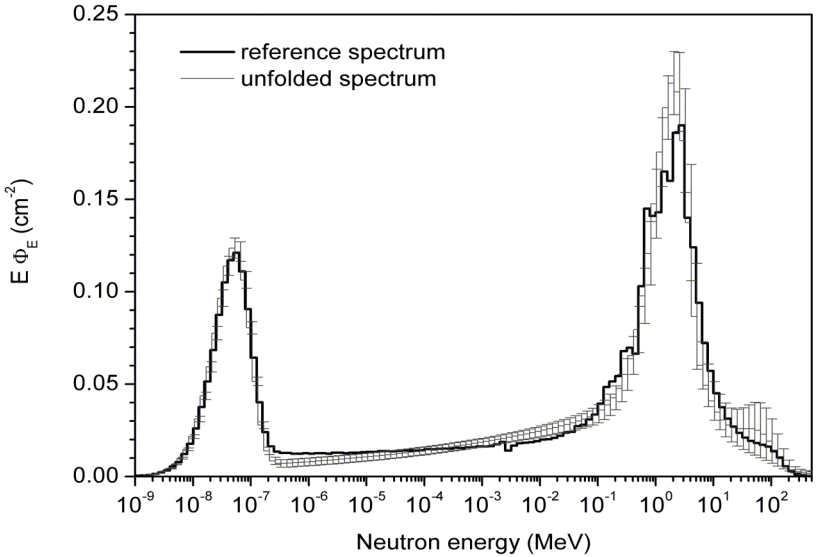


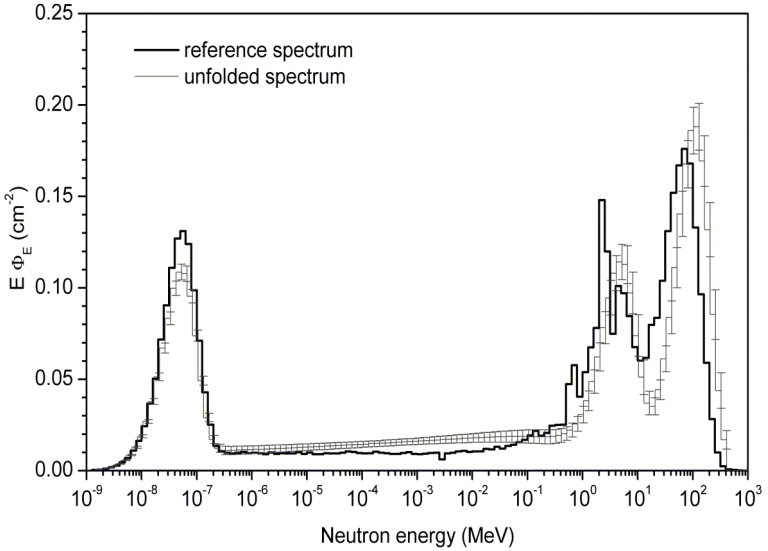
Simulated exposure to a high energy neutron field (unshielded high energy electron source).



Simulated exposure to a high energy neutron field (shielded high energy proton source).

4) Neutroni di alta energia (simulazioni)





neutron spectrum		total fluence (cm^{-2})	h*(10) ($pSv.cm^2$)	fluence fractions (%)			
				E < 0.4 eV	0.4 eV < E < 10 keV	10 keV < E < 20 MeV	E > 20 MeV
high-E electrons unshielded point	reference	1	216	12.6	26.2	57.2	4.0
	unfolded	0.98±0.02	218±11	14.0	24.2	56.9	4.9
high-E protons shielded point	reference	1	247	12.8	21.8	35.1	30.3
	unfolded	1.07±0.05	238±15	11.6	22.9	29.5	36.0

Designing an extended energy range single-sphere multi-detector neutron spectrometer

J.M. Gómez-Ros [1,2], R. Bedogni [2], M. Moraleda [1], A. Esposito [2], G. Mazzitelli [2], L. Quintieri [2], B. Buonomo [2], M.V. Introini [3,4], A. Pola [3,4]

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