

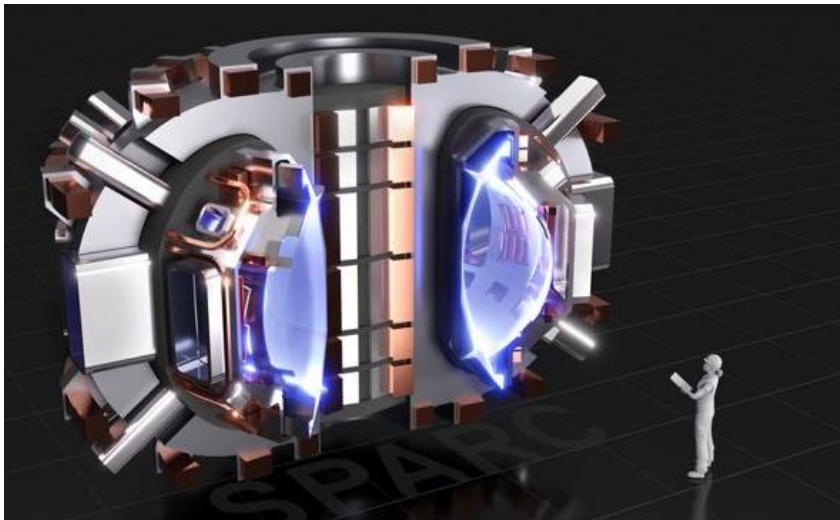
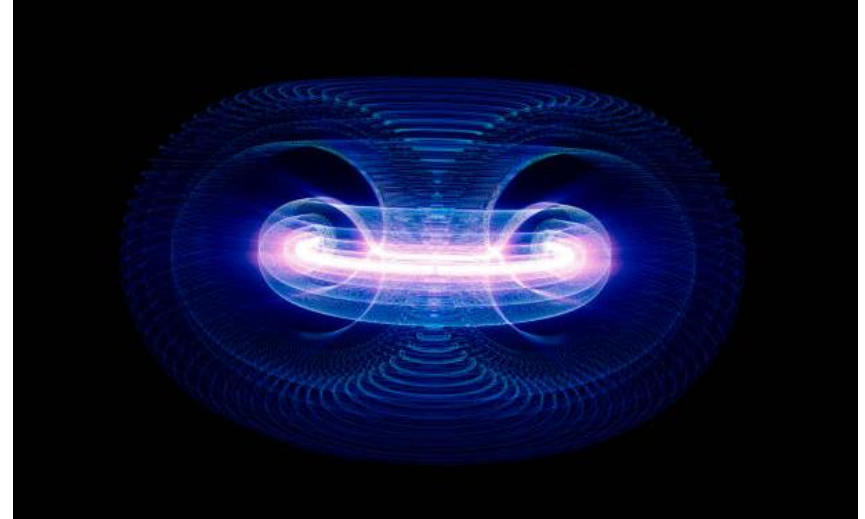
NEUTRON SPECTRA IN FUSION-FISSION HYBRID REACTOR (FFHR) FOR SPENT FUEL TREATMENT

**Jorge GARCIA GALLARDO, Juana GERVASONI,
Fabricio RUIZ, Nicolas GIMENEZ**

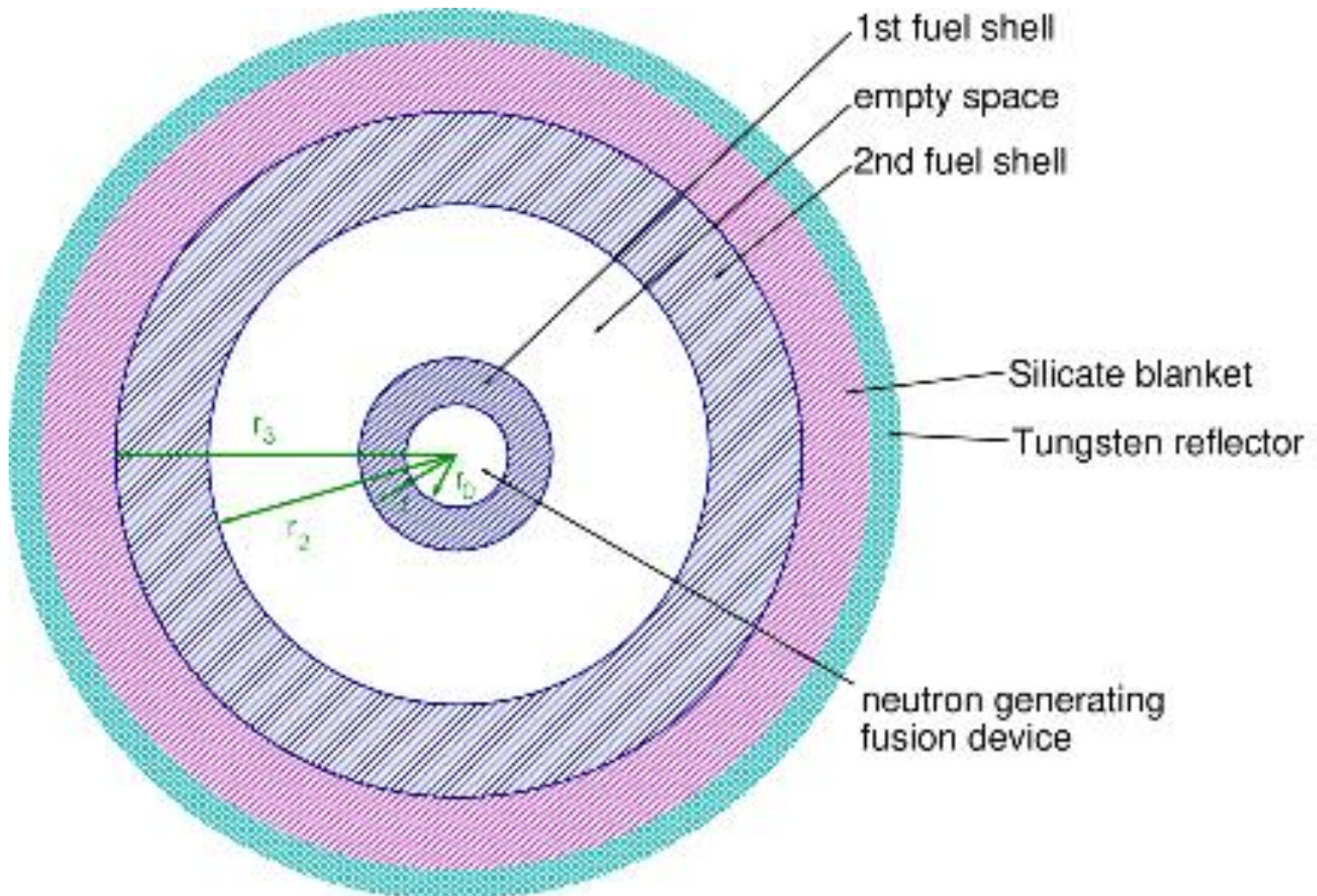


**Centro Atómico Bariloche, Argentina
Comisión Nacional de Energía Atómica (CNEA).
Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET).**

Searching for solutions...



Concentric model for an FUSION-FISSION HYBRID REACTOR (FFHR)



Parameters of the FFHR

Fuel Shell 1	Internal radius	40 cm	Fuel Shell 2	Internal radius	411.8 cm
	Thick	5.4 cm		Thick	14.2 cm
	Volume	0.1239 m³		Volume	31.3 m³
	Mass	2366 Kg		Mass	598128 Kg
	Fuel	8% enriched U		Fuel	8% enriched U

A. CLAUSSE, L. SOTO, C. FRIEDLI and L. ALATAMIRANO. *Feasibility study of a hybrid subcritical fission system driven by plasma-focus fusion neutrons*. Annals Of Nuclear Energy, 78, (2015) pp 10-14.

MCNP[®] and **Monte Carlo N-Particle[®]** are registered trademarks owned by Triad National Security, LLC, manager and operator of Los Alamos National Laboratory.

Parameters of the FFHR: Blanket

Breeder Blanket	Internal radius	426 cm
	Thick	50 cm
	Volume	127.7 m³

Material	Li₄SiO₄	Li₂SiO₃
Mass [kg]	303934	321813
Internal radius	476 cm	
Thick	4 cm	
Mass	221659 Kg	
Volume	114.8 m³	
Material	Natural W	
Multiplying parameter (keff)	0.969	0.980

FFHR: Normalized flux for different shells

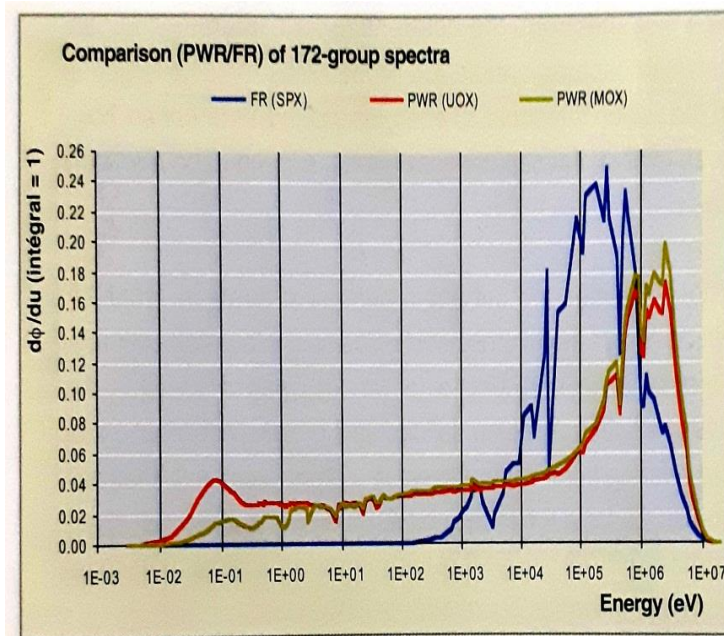
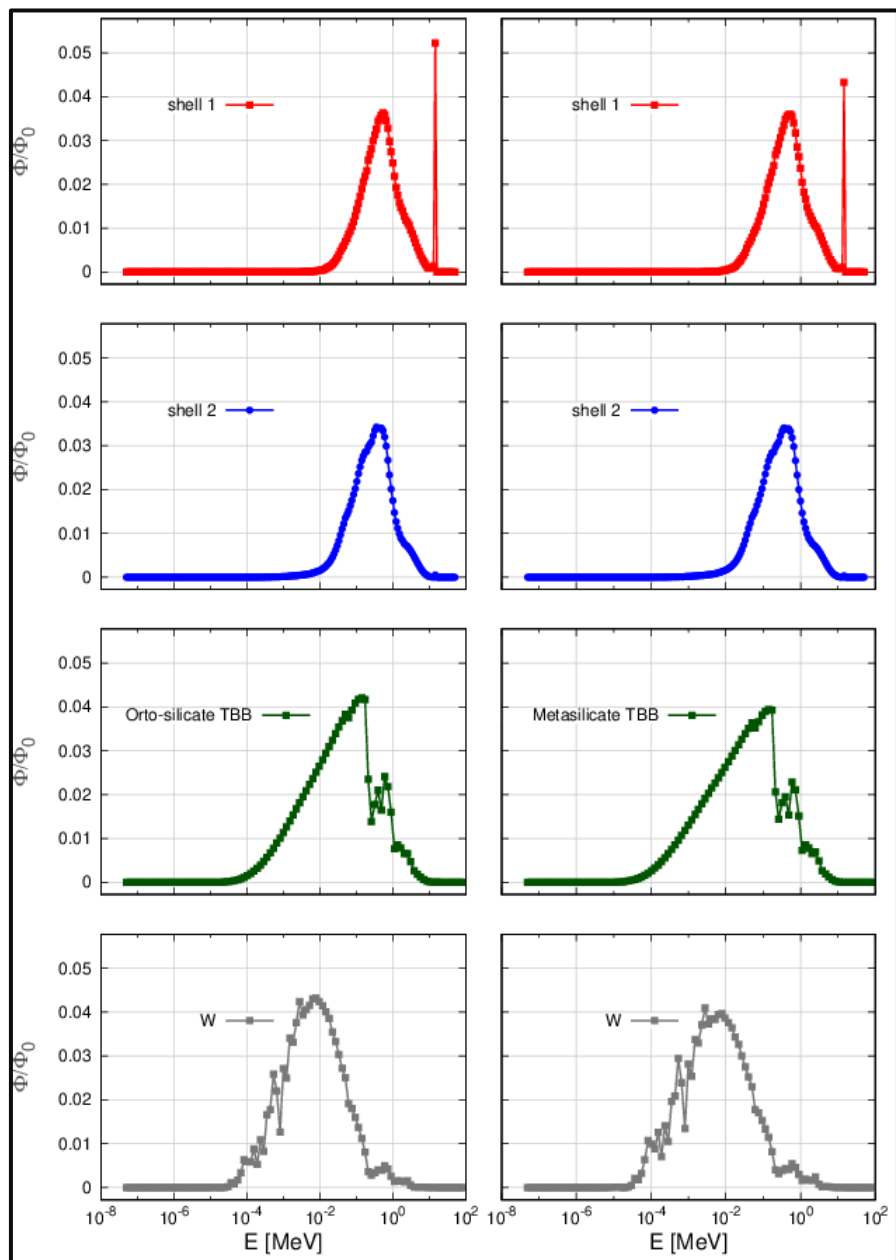
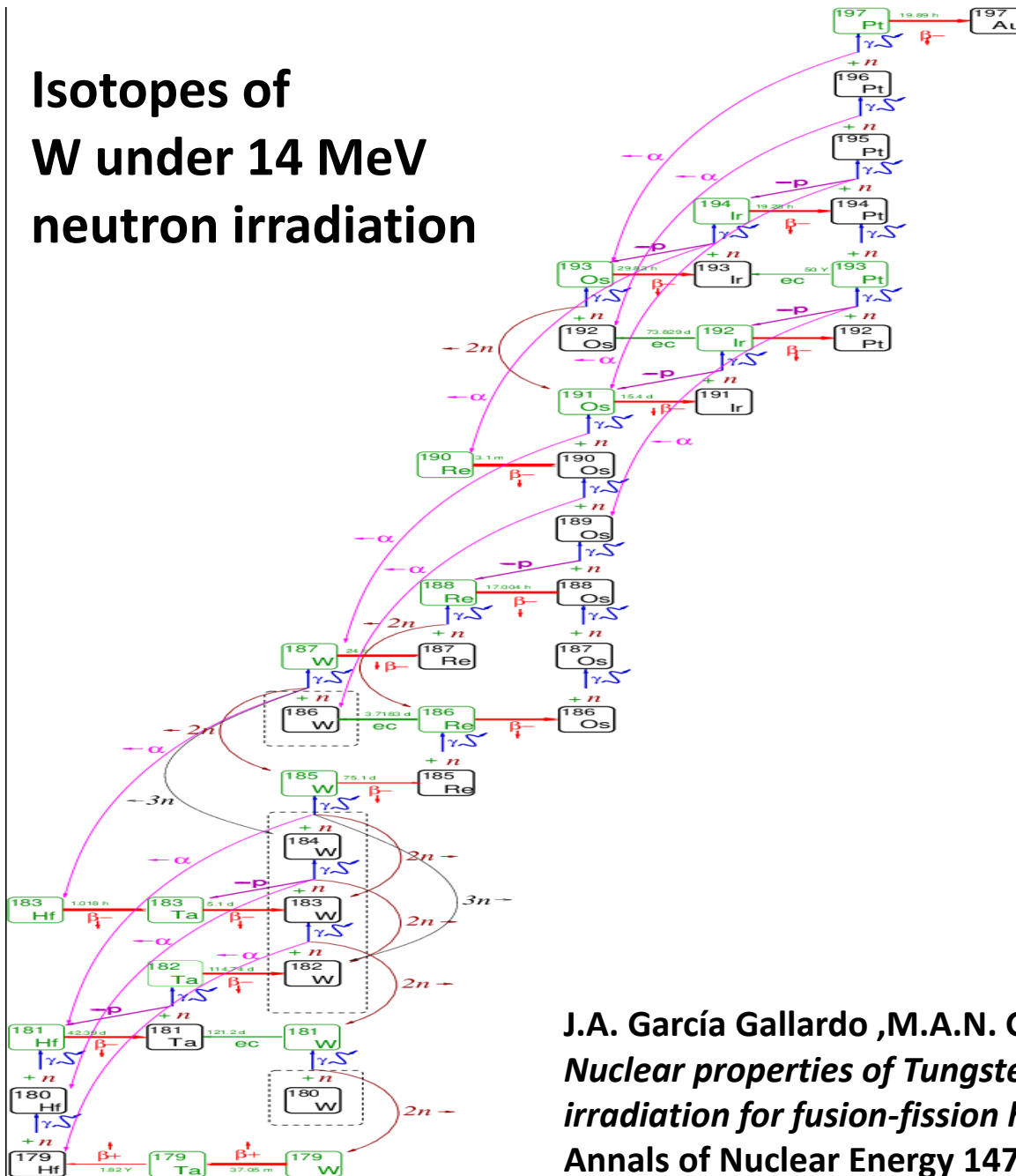


Fig. 178. Comparison of neutron spectra, for a pressurized-water reactor, and a sodium-cooled fast reactor.

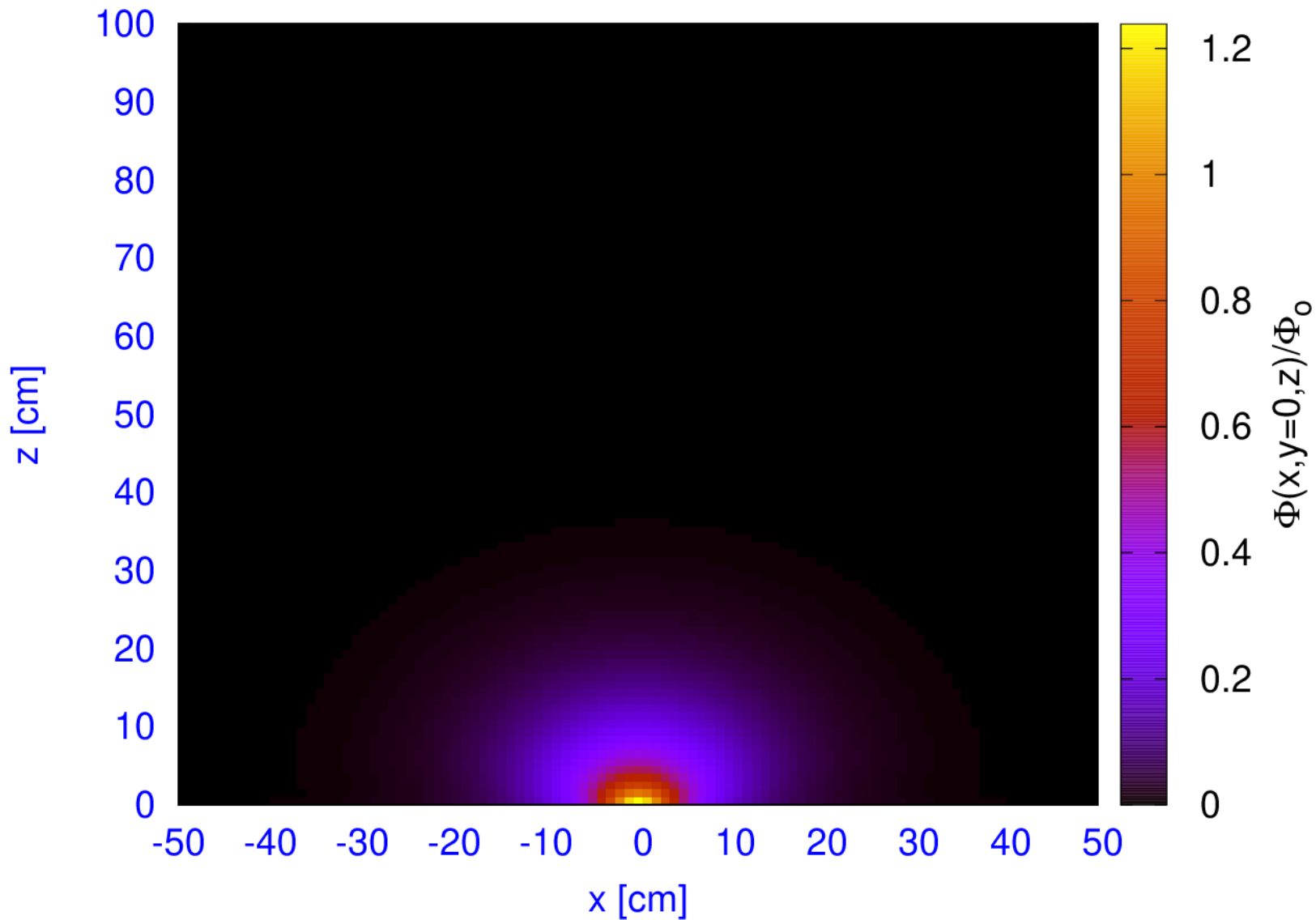
J.F. PARISOT. Treatment and recycling of spent nuclear fuel, Ed. Le Moniteur, Comisariat à l'énergie nucléaire, Saclay, (2008).

Isotopes of W under 14 MeV neutron irradiation



J.A. García Gallardo ,M.A.N. Giménez, J.L. Gervasoni
Nuclear properties of Tungsten under 14 MeV neutron irradiation for fusion-fission hybrid reactors.
 Annals of Nuclear Energy 147 (2020) 107739

Tungsten shielding capacity for 14 MeV neutrons.





Thank you!