

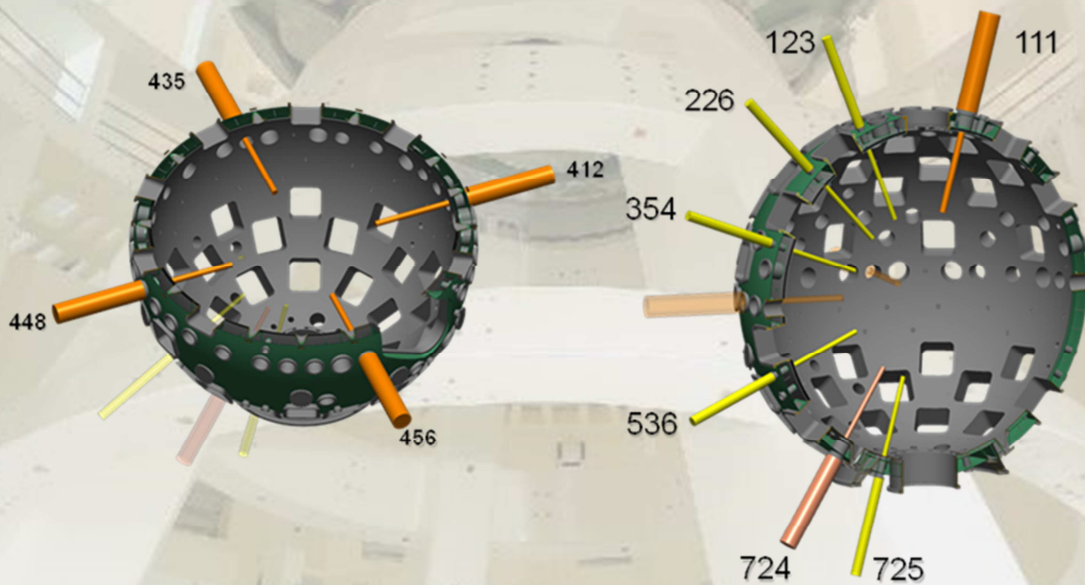
Neutron Pack

Activation and nTOF diagnostics

The Neutron Pack is a set of several diagnostics to measure neutron yield, ion temperature, neutron bang time and the ratio of secondary to primary neutron reactions during D₂ and DT implosions.

This set of diagnostics consists of several neutron Time of Flight detectors (nTOF: Gated photomultiplier tubes and scintillators, photodiodes, CVD diamonds) and activation (indium, copper, zirconium, etc.). All these diagnostics will be installed in several stages:

- In 2019, a first set of 4 nTOF detectors will be placed to describe an equator and a near polar axis. All nTOF detectors will be installed in the target chamber at 3.5 meters from TCC using re-entrant tubes.
- Later, the activation diagnostic will complete the Neutron Pack and 7 more nTOF detectors will complete the nTOF diagnostic to be able to measure neutron yield and ion temperature anisotropy. Some other nTOF detectors will be placed on long LMJ equator lines of sight (East and West) and on the south low noise line of sight at 16° from the polar axis.



Characteristics	Yield (neutrons)	Spatial resolution / Field of view	Time resolution (ps)	Setting/ Operational
Activation	D ₂ : 10 ⁹ to 10 ¹⁵	without	without	Inside & outside target chamber
Gated PMT + scintillator			50 (Timing accuracy)	
Photodiode	DT: 10 ⁹ to 5.10 ¹⁸	without	50 (Timing accuracy)	2019
CVD diamonds				