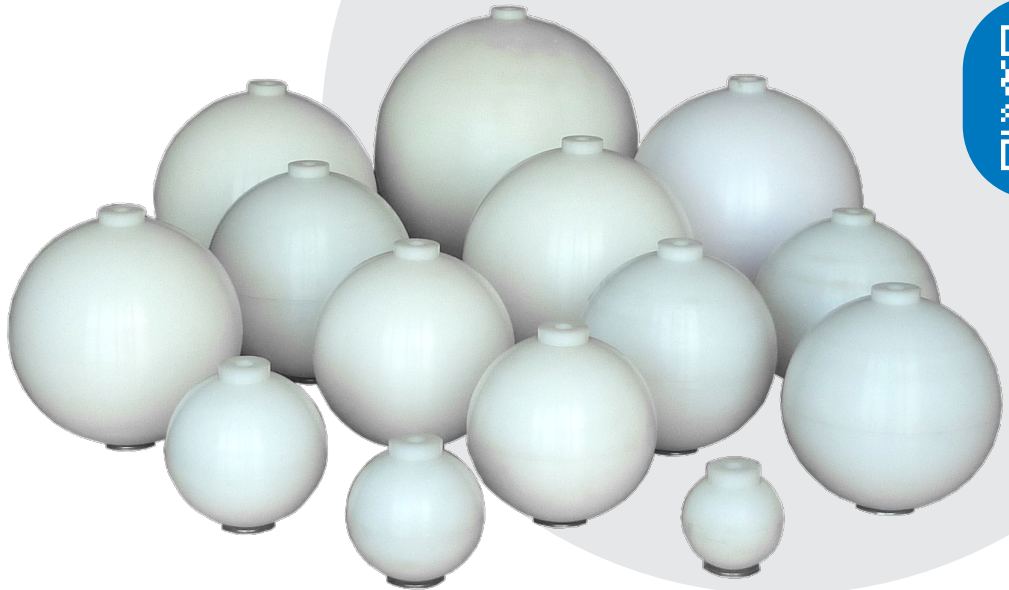




BSS

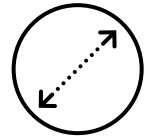
BONNER SPHERE SPECTROMETER



Turnkey solution



Worldwide standard



Customizable moderator
assembly and quantity

He-3 proportional counter
detector

HDPE spherical moderators,
from Ø 3" to Ø 18"

Accessory extension set for
energy range up to 10 GeV

Proprietary unfolding code
available

Optional special electronics
for use in pulsed fields

The **Bonner sphere spectrometer** consists of an array of He-3 proportional counter thermal neutron detectors, each housed in a spherical HDPE moderator of different diameters.

BSS is proposed in two main configurations, adjustable according to the requirements, for single or multiple detectors.

An unfolding software (RUFUS), used to calculate the neutron spectrum, is also available for both configurations.

Each proportional counter is connected to a compact electronic module (2.5 cm diam. x 7.6 cm), providing:

- Precision wide band charge sensitive pre-amplifier and amplifier
- Twelve-turn trim pot to finely tune the high voltage (0-2200 V) to the desired level to obtain a good high voltage plateau
- Discriminator circuit that produces, when a charged event is detected, a TTL pulse
- Amplifier gain control trim pot controlling the discriminator level
- Analog monitoring test point allowing direct monitoring of amplified signal using an oscilloscope
- Test point to measure the high voltage setting

A user-friendly dedicated acquisition software can be installed on the PC managing the BSS, allowing the user to start and stop the measurements, to modify the parameters and to visualize the saved data.

The standard set includes the following HDPE moderator diameters: Ø 3", Ø 3.5", Ø 4", Ø 4.5", Ø 5", Ø 6", Ø 7", Ø 8", Ø 10", Ø 12", Ø 15", Ø 18".

The **available configurations** of BSS are:

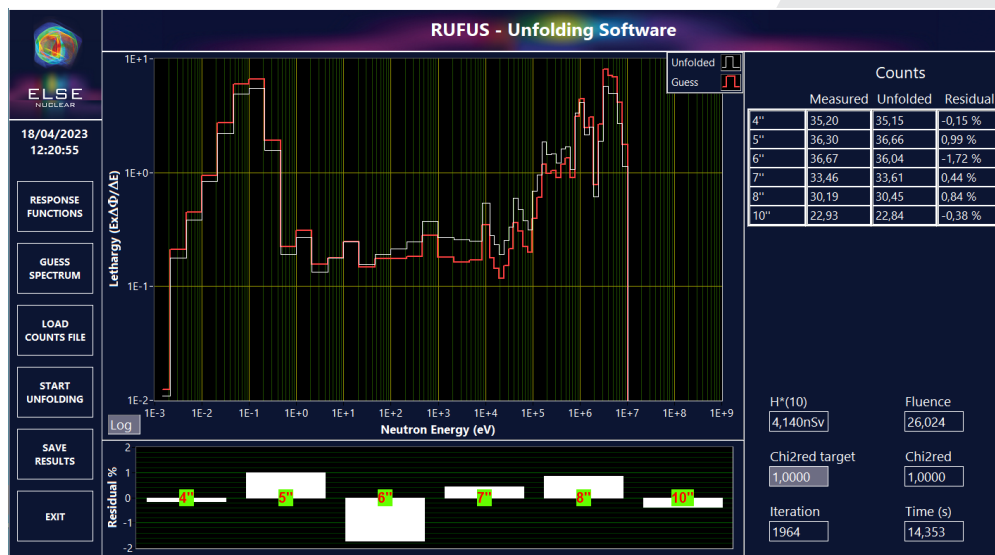
- Single detector: includes only one He-3 proportional counter, to be inserted in one moderator sphere at a time. The detector is managed by a Counter Module and the user interface is the "Single counter" software.
- Multiple detectors: includes up to 16 He-3 proportional counters, and up to 16 moderator spheres (12 standard + 4 accessory), to be employed at the same time. The detectors are managed by a Datalogger and the user interface is the "DLOG" software.



He-3 insert assembly

TECHNICAL SPECIFICATIONS

- He-3 spherical proportional counter detector
- Gas filling pressure: 2 atm or 8 atm for higher sensitivity
- Housing: HDPE cylindrical inserts
- Aluminium supports designed to easily align the centre of the detectors active volume at the same height



BSS unfolding software - RUFUS



OPTIONS

- 8 atm gas filling pressure for higher sensitivity
- Special electronics (with no dead time) for use in pulsed fields

ACCESSORIES AVAILABLE UPON REQUEST

- Bonner sphere set for extension to 10 GeV
 - Ø 3" HDPE inner moderator, 1" lead shell, Ø 7" HDPE outer moderator
 - Ø 4" HDPE inner moderator, 0.5" lead shell, Ø 7" HDPE outer moderator
 - Ø 4" HDPE inner moderator, 1" lead shell, Ø 8" HDPE outer moderator
 - Ø 4" HDPE inner moderator, 0.5" copper shell, Ø 7" HDPE outer moderator
- Unfolding code for automatic spectra and $H^*(10)$ calculation
- Response functions obtained via Monte Carlo simulations
- Flight case
- Warranty extension from 12 months to 24 months



BSS flight case

