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Neutron moderators for the European Spallation Source

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The design of the neutron moderators for the European Spallation Source, intended to be installed at the start of operations of the facility in 2019 has now been finalized and the moderators are being fabricated.

Among the driving principles in the design have been flexibility for instruments to have access to cold and thermal neutrons with highest possible source brightness.

Different design and configuration options were evaluated. The final configuration accepted for construction foresees two moderators with identical para-hydrogen (so-called “butterfly”) shape, but different heights, placed above and below the spallation target. Both moderators are able to serve the full $2 \times 120^\circ$ beam extraction sectors of instrument suite. The top, 3-cm tall moderator, has both high thermal and high cold brightness, more than by a factor of 2.5 compared to the previous design of the Technical Design Report. The bottom, 6-cm tall moderator, has lower brightness and emits 1.3 times higher total intensity integrated over the 2 times larger emission surfaces.

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