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The ESS target design and beam raster system

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The European Spallation Source (ESS) is currently being constructed near the city of Lund in southern Sweden. When finalized and fully commissioned around 2025 it will be the world leading neutron scattering facility available to the science community. Unprecedented neutron flux and brightness will be achieved through the use of a state-of-the-art proton linear accelerator and a high-power target and a novel moderator design. Some of the unique features are the rotating and helium-cooled solid target, and the flat thermal and cold moderators. Also, the use of a set of raster scanning magnets for expansion of the proton beam onto the target, is a progressive choice. Other key objectives, parallel to the performance goal, are to make provisions for a safe, stable and reliable operation.

After a brief description of the overall configuration of ESS and a few high level nominal operating parameters for the facility, the presentation will focus on specific details of the proton beam expansion system, the target, and its cooling. Rationale for the employed design solutions will be addressed. Also, some interesting effects on the neutron output to the scientific instruments will be mentioned.