

Initial Target Concepts for ISIS-II

Conceptual design studies are now underway for ISIS-II [1], the successor to the UK's pulsed neutron and muon source. Appropriate target technologies must be selected for each of the two proposed neutron target stations, to achieve a balance between neutronic performance and engineering reliability.

An essential choice early in the design process is between a stationary solid target or a rotating wheel; therefore it is necessary to understand the limits of achievable beam power on a stationary solid target. Safe operating limits must be defined for direct beam on target, as well as residual decay heat in a Loss of Coolant Accident (LOCA) scenario. Decay heat rather than direct beam has been found to be the limiting factor in some recent facility designs.

This talk will present the current status of preliminary designs for an ISIS-II target concept which enables the highest possible beam power on a static solid target. Detailed optimisation procedures will be presented elsewhere at this conference [2]. Strategies to mitigate the severity of a LOCA scenario were considered from the conceptual design phase. Alternative designs for rotating target wheels will also be presented. The selection of candidate core and cladding materials for ISIS-II targets is still in the early stages. A broad overview will be given of the current status of irradiated material studies, knowledge gaps and plans to address these.

References

[1] Outline plans for target stations at the ISIS-II facility –S. Gallimore ICANSXXXIV 2023

[2] Optimisation Procedures for ISIS-II Targets –D. Wells-Calvo ICANSXXXIV 2023

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