

Spallation Source Facilities

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The world has seen three new spallation neutron source facilities become operational over the past decade. Two short-pulse, mercury target, mega-watt class sources – the SNS at ORNL, and the JSNS at JPARC – joined the continuous wave MW source SING facility at PSI that is now in its second decade of operation. The other new source now online is the modestly powered but innovative ISIS TS-2 at RAL, built complementary to the venerable TS-1. At only 32 kW, TS-2 is a product of a more integrated design optimization approach for target, moderators, and reflector – along with sharply defined neutron performance metrics for the associated neutron science instruments. Soon the operating facilities will be joined by the 100 kW CSNS in Dongguan, China and the 5 MW ESS in Lund, Sweden. Design features, performance characteristics and operating challenges of these and other spallation sources will be broadly compared in this talk. While mission requirements and funding sponsor expectations vary from site to site, a lesson from TS-2 is that high neutron source performance is possible without high power. For this workshop, discussion on the challenges and approaches of target-source design to optimize science performance will be a theme; this talk aims to lay some ground in the spallation source arena.

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