



中国科学院高能物理研究所
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STATUS OF CHINA SPALLATION NEUTRON SOURCE (CSNS)

CSNS Team

The China Spallation Neutron Source (CSNS) facility is designed to provide multidisciplinary platforms for scientific research. The site of CSNS has been selected at Dongguan, Guangdong Province. In the Phase I of the project, the facility comprises an 80-MeV H^- linac, a 1.6-GeV proton rapid cycling synchrotron (RCS), beam transport lines, a solid tungsten target station, and 3 initial instruments for the pulsed spallation neutron applications. The RCS provides a beam power of 100 kW with a repetition rate of 25 Hz. The beam power can be further increased to 200 kW in the Phase II. A series of R&D for major components have been performed since 2006. The project design proposal was approved by the Chinese central government in September 2008. The preliminary site geological survey has been completed. The groundbreaking is planned in 2010.

Key Milestones

- Feb. 2001 idea of CSNS discussed
- Jun. 2005 project proposal approved in principle by central government
- Jan. 2006 CAS funded (30M CNY) for R&D 1
- Jul. 2007 Guangdong funded (40M CNY) for R&D 2
- Dec. 2007 project proposal review
- Sep. 2008 project proposal approved by central government
- Oct. 2009 project feasibility study review
- May 2010 expect to start project construction (ground breaking)

Schedule

- Prototyping R&D Jan. 2006 – Jul. 2010
- Construction start May 2010
- Civil construction May 2010 – May 2013
- Component fabrication May 2010 – May 2014
- Installation & tests Jan. 2013 – Jan. 2015
- Integrated system commissioning May 2014 – Nov. 2015
- 1st beam on target Nov. 2015
- Project complete/operation start Nov. 2016

Design Goal

Beam power (kW)	Repetition rate (Hz)	Beam current (μA)	Energy (GeV)	Max neutron flux* ($n/cm^2/s$)	Number of instruments
100	25	63	1.6	10^6	3

R&D and prototyping work has been carried out since 2006. Over 30 prototyping items (covering most key technologies) have been completed and in the test process.

H⁻ ion source

RFQ

DTL

Injection bumper

Linac RF

Target mockup test stand

Chopper

³He Neutron Detector

Extraction kicker and PS

RCS dipole PS

RCS RF cavity

Neutron instruments

Target station $P_n = 100 \text{ kW}$

RCS 1.6 GeV, 62.5 μA , 25 Hz

DTL 80 MeV, 324 MHz

RFQ 50 keV, 3 MeV, 324 MHz

LEBT $I_p = 20 \text{ mA}$

MEBT

LRBT

RTBT