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Design and Progress of CiADS Beam Line to Reactor

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CiADS (China initiative Accelerator Driven sub-critical System) is an experiment facility to demonstrate the ADS concept with high energy proton beam hitting the LBE (Liquid Lead-bismuth Eutectic) target, generating high-flux neutrons to boost the reacotor to transmutate nuclear waste. BLR (Beam Line to Reactor) is one of the key part in CiADS program, which is to transport and match the 2.5 MW beam from superconducting linac to the target inside reactor. BLR needs to meet the requirements both of low beam loss along the beam line and beam density homogenization on the beam window. With special design of beam collimation in phase space, beam loss is limited within 1 W/m along the beam line. By appling multi-order Fourier harmonic superposition scan, beam PCD (Peak Current Density) on the beam window is controlled within 35 μA/cmˆ2 for 5 mA beam in φ250 mm beam tube. In the presentation, the design, key technology progress and project plan will be introduced.

Footnotes

Funding Agency

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Yes

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