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Laser transport and stabilization for the CSNS laser wire profile monitor prototype

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A laser wire monitor has been developed at the China Spallation Neutron Source (CSNS). The monitor utilizes a 1064 nm laser source to measure the horizontal and vertical profiles of a negative hydrogen ion (H^-) beam with an energy of 80 MeV in the injection zone. This paper describes the design of the laser optical path layout and the characterization of the transport performance. The experiment focuses on the laser system's quality factor $M2$ of the laser after more than 60 meters of transmission as well as the beam pointing stability. In this experiment, the laser quality factor $M2$ after transmission is better than 4, and the beam pointing stability after focusing is less than $\pm 2.5 \mu m$, which is able to satisfy the required specifications for the first laser wire monitor of the CSNS.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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