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T0 Fanout for Back-n White Neutron Facility at CSNS

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The main physics goal for Back-n white neutron facility at China Spallation Neutron Source (CSNS) is to measure nuclear data. The energy of neutrons is one of the most important parameters for measuring nuclear data. Method of time of flight (TOF) is used to obtain the energy of neutrons. The time when proton bunches hit the thick tungsten target is considered as the start point of TOF. T0 signal, generated from the CSNS accelerator, represents this start time. Besides, the T0 signal is also used as the gate control signal that triggers the readout electronics. Obviously, the timing precision of T0 directly affects the measurement precision of TOF and controls the running or readout electronics. In this paper, the T0 fan-out for Back-n white neutron facility at CSNS is proposed. The T0 signal travelling from the CSNS accelerator is fanned out to the two underground experiment stations respectively over long cables. To guarantee the timing precision, T0 signal is conditioned with good signal edge. Furthermore, techniques of signal pre-emphasizing and equalizing are used to improve signal quality after T0 being transmitted over long cables with about 100 m length. Experiments show that the T0 fan-out works well, the T0 signal transmitted over 100 m remains a good time resolution with a standard deviation of 25 ps. It absolutely meets the required accuracy of the measurement of TOF.

Description

beam T0 board

Institute

USTC

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Country

China

Minioral

No

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