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Improving the phase stability of the 201.25 MHz BPPM reference for the LANSCE 805 MHz LINAC

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The Los Alamos Neutron Science Center (LANSCE) employs the use of BPPMs (Beam Position and Phase Monitors) to track the position and phase of beam throughout the site. In the past, BPPMs in the 805MHz CCL (Coupled Cavity Linac) section of the site used a 201.25MHz reference over facility network fiber, using RF media converters. This fiber reference distribution gave rise to give a large diurnal phase & temperature dependency causing a large error in beam phase measurement. A system was devised to use the site's temperature controlled 805MHz reference divided by 4 as a 201.25MHz reference, with the $n \cdot 90^\circ$ phase uncertainty eliminated through measurement of phase between 805MHz divided by 4 and fiber 201.25MHz alongside a switched hybrid coupler network. Deployment of 7 phase reference units in 2022 allowed for greatly reduced error in beam phase measurement.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

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