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Optimisation of SLED Cavities and Waveguide Network to Drive the Linac at the Australian Synchrotron

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With the ageing of equipment in user facilities, the risk of downtime due to hardware malfunctions becomes a more likely scenario. At the Australian Synchrotron, two klystrons running at 15 MW each are required for injection into the booster ring. Consequently, failure of a single klystron could lead to the loss of weeks of beam time. A forthcoming upgrade to the current system includes a SLED system for pulse compression to increase output power, and allows for the use of a single klystron for full energy injection from the linac. This paper describes the optimisation of the SLED cavities and waveguide system to deliver electrons at nominal energies in single bunch mode. Following is an analysis on maximising the possible bunch train length multi-bunch mode and a brief look at the feasibility of generating electrons at greater energies.

Summary

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