

ALBA injector reliability improvement with an 80 MeV Linac beam

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The ALBA injector consists of a 110 MeV Linac, a Linac-to-Booster Transfer Line and a full energy Booster that further accelerates the electrons up to 3 GeV. The Linac consists of two pre-bunchers, a buncher and two accelerating structures and it is powered by two pulsed 37 MW klystrons at 3 GHz. To overcome an eventual klystron failure the injector has been adapted to keep operative at lower Linac beam energy. In 2014 the injection into the Booster was optimized for a Linac beam of 67 MeV, the energy achieved using only one klystron. However, the procedure of switching the injector from a Linac beam of 110 MeV to a 67 MeV one is not straightforward and it requires to be periodically updated. After a recent waveguide modification the RF power sent to the first accelerating structure is equally distributed between both accelerating structures. As a result, a Linac beam of 80 MeV is achieved using only one klystron. At this energy the injection into the the Booster is more efficient. Then, setting the nominal Linac beam energy at 80 MeV the injector operation is ensured by the hot-spare klystron in case of klystron failure.

Footnotes

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