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Defocusing beam line design for an irradiation facility at the TAEA SANAEM Proton Accelerator Facility

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Beam line design, irradiation facility, proton irradiation tests

Summary

Electronic components must be tested to ensure reliable performance in high radiation environments. We propose a defocusing beam line to perform proton irradiation tests in Turkey. The Turkish Atomic Energy Authority SANAEM Proton Accelerator Facility was inaugurated in May 2012 for radioisotope production. The facility has also an R&D room for research purposes. The accelerator produces protons with 30MeV kinetic energy and the beam current is variable between 10 μ A to 1.2mA. The beam kinetic energy is suitable for irradiation tests, however the beam current is high and therefore the flux must be lowered. We plan to build a defocusing beam line (DBL) in order to enlarge the beam size and reduce the flux. Current design includes two quadrupole magnets to blow up the beam. Scattering foils and a collimator is placed for the reduction of beam flux. The DBL is designed to provide fluxes between 107 p/cm²/s and 109 p/cm²/s for performing irradiation tests. The facility will be the first irradiation facility of its kind in Turkey.

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