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Shielding Analysis for the ATLAS Booster Upgrade

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Argonne's ATLAS accelerator facility is a national user facility for low-energy nuclear physics. Ions from protons to uranium are produced by one of two ECR sources, accelerated in the booster linac and the main ATLAS linac, and then directed to one of three experimental areas. ATLAS has just finished upgrading the booster linac to provide a significant increase in current. This paper presents the results of shielding analyses for the booster upgrade. Radiation transport calculations are performed with the radiation transport code MCNPX using neutron and gamma source rates calculated with the fusion-evaporation code NEUGAM. The presentation will address the many constraints that derive from the fact that the upgrades must fit into the existing facility structure and be consistent with present operating modes. The booster linac shielding is modular and capable of being disassembled to allow for removal of accelerator components in the event maintenance is required. Facility modifications were also made to accommodate future upgrade stages.

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