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Single Event Effects qualification of candidate components for the ATLAS Tile Calorimeter Phase-II Upgrade Low Voltage power supply Bricks

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Irradiation campaigns have been carried out in a variety of European facilities to select radiation hard candidates for the upgraded version of the transformer coupled buck converter (Brick). The ATLAS detector is set to undergo a significant upgrade termed the “Phase-II” Upgrade. This talk primarily focuses on the exposure of selected active components (power MOSFETs, MOSFET drivers and isolation amplifiers) to a high energy proton beam at the Proton Irradiation Facility in PSI. A full scale production of nearly 2048 finger Low Voltage power supplies Bricks, with an identical output voltage, is set to be undertaken in the year 2022. The Low Voltage power supply (LVPS) Brick design, which powers the TileCal front-end electronics is currently being finalized. The tested single batch components were selected among candidates suitable to survive the full radiation tolerance in preparation for the HL-LHC. A detailed compilation of the SEE results obtained, along with the relevant set-up and observations will be discussed.

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