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New GaN driver amplifier for RHIC 197 MHz rf system

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A new radiofrequency (rf) driver amplifier is being designed to replace 3 kW rf amplifiers that are part of the 197 MHz rf system in the Relativistic Heavy Ion Collider (RHIC) located at Brookhaven National Laboratory. A prototype was built using a gallium nitride device able to operate up to 100 V on the drain side. First measurements indicate that a single unit can generate power in excess of 1.7 kW at over 70% power-added efficiency. This work presents details about its electromagnetic and thermal design, and other important specifications regarding operation in RHIC.

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