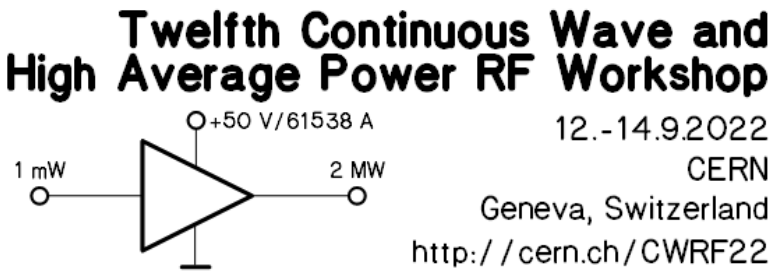

Contribution ID: **35** Type: **Oral presentation 20' + 5'**

Planning, requirements, features, vendor design and development status of 60kW 500 MHz AR RF HPA for ALSU project

Monday, 12 September 2022 14:50 (25 minutes)

A solid state LDMOS FET based RF High Power Amplifier (HPA) with 60 kW CW RF output power , operating at 500 MHz, with a power gain ˜ 80 dB is being designed and manufactured for the Accumulator Ring (AR) RF cavity in the ALS-U project at LBNL, through a joint effort with a commercial company, R&K. This paper presents the highlights of the important initial planning, installation site space constraints, technical specifications, features, modular construction & numerology, build standards requirements, safety standards etc., of the various diverse subsystems viz., AC power distribution, parallel DC power distribution system and DC bus bar, modular RF amplifiers used for preamplifiers & final amplifiers, high power combiners, control system using PLC & FPGA for slow/ fast response of various interlocks & local/ remote operation, LCW & heat exchanger, cabinet structure etc., in this HPA. This paper will also present the HPA important design requirements like high reliability, redundancy with failed RF amplifier and/or DC power modules, fault tolerance of control system to failed modules etc., that are incorporated in HPA design by R&K. The important thermal management of power dissipation in this HPA is also presented. The design by the vendor is well matured and manufacturing of HPA by vendor shall begin shortly.

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