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High-Power Electrically Controlled RF Switches

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We consider to develop GeV-level high-gradient linacs. These accelerators will be based on an short-pulse cryogenically cooled copper technology that will provide a gradient of 300 MV/m or higher. Since there is a shortage of high-power nanosecond RF sources, we propose the development of the pulse compression methods. Instead of passive pulse compressors like SLED, SLED-II and its recent modifications requiring broad bandwidth klystrons we focus on active RF switches. In our review we compare RF switches based on different principles including plasma switches, semiconductor switches, ferroelectric switches, and switches based on electron beam injection in an RF resonator. We come to the conclusion that the last mentioned type of switches is not vulnerable to a multipactor and it is most appealing for a high-gradient acceleration.

Working group

WG4 : Novel structure acceleration

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