

## Design Efforts of PAL XFEL RF Components to Reduce RF Breakdown Due to Surface Electric Gradient in High Power Operation

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The peak klystron power for the PAL (Pohang Accelerator Laboratory) XFEL (X-ray Free Electron Laser) is up to 80 MW which is higher than that of PLS-II LINAC. To prevent the RF breakdown such a high power operation, some of RF components need to be redesigned to reduce the surface electric field gradient to be less than the breakdown gradient at the vacuum-metal surface. For instances, the redesign of the Stanford Linear Accelerator Energy Doubler (SLED) system, the directional coupler and 3dB power splitter using the finite-difference time-domain (FDTD) simulation will be presented.

**Keywords:** PAL XFEL, Surface field gradient, SLED