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## Standing Wave Dielectric Disk Accelerating Structure Design and Cold Test Results

*Tuesday, 23 July 2024 18:00 (1h 30m)*

A Dielectric Disk Accelerator (DDA) is a metallic accelerating structure loaded with dielectric disks to increase coupling between cells, thus high group velocity, while still maintaining a high shunt impedance. This is crucial for achieving high efficiency high gradient acceleration in the short rf pulse acceleration regime. Recent research of these structures has produced traveling wave structures that are powered by very short (~9 ns), very high power (400 MW) RF pulses using two beam acceleration at the Argonne Wakefield Accelerator Complex. In testing, these structures have withstood more than 320 MW of power and produced accelerating gradients of over 100 MV/m. A new standing wave DDA structure is being fabricated for testing on the Nextef2 test stand at KEK that will be tested on a more conventional, klystron power source. Simulation results of this structure show that at 50 MW of input power, the DDA produces a 457 MV/m gradient. It also has a large shunt impedance of 160 M $\Omega$ /m and an  $r/Q$  of 21.6 k $\Omega$ /m. Cold testing of this structure will be conducted July 2024 with high power testing beginning in August.

### Working group

WG4 : Novel structure acceleration

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