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High Gradient Wakefield Generation at the Upgraded Argonne Wakefield Accelerator Facility

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The recently upgraded AWA facility is being commissioned. Operation of the new L-Band RF gun with a Cesium Telluride photocathode will generate long electron bunch trains, with high charge per bunch (up to 100 nC). The six new linac tanks will boost the beam energy to 75 MeV, making it an extremely well suited drive beam to excite wakefields in structures. One of the main goals of the facility is to generate RF pulses with GW power levels, corresponding to accelerating gradients of hundreds of MV/m and energy gains on the order of 100 MeV per structure. A key aspect of the studies and experiments carried out at the AWA facility is the use of relatively short RF pulses (15 –25 ns), which is believed to mitigate the risk of breakdown and structure damage. Initial plans for the demonstration of two stages of acceleration will also be presented.

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