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Ultra-high energy density physics in aligned nanowire arrays

Wednesday, 21 June 2017 16:00 (1h 45m)

The creation of ultra-high energy density (UHED, >1x10^8 J/cm³) plasmas in compact laboratory setups enables studies
of matter under extreme conditions and can be used for the efficient generation of intense x-ray and neutron pulses. An
accessible way to achieve the UHED regime is the irradiation of vertically aligned high-aspect-ratio nanowire arrays
with relativistic femtosecond laser pulses. These targets have shown to facilitate near total absorption of laser light
several micrometers deep into near-solid-density material. We investigate the depth of the volumetric heating and a
mechanism causing the wires to pinch, thereby delaying the hydrodynamic expansion and achieving extremely high
energy and particle densities.

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