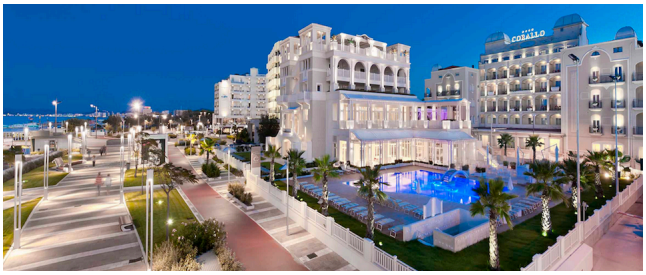

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Capillary Channel Formation in PMMA and Electrons Acceleration by a Long-Pulse KrF Laser

Thursday, 8 June 2023 12:40 (20 minutes)

A narrow (30–40 μm in diameter) capillary-like rippled channel finished by a post-channel crown was observed in 2D hydrodynamic interaction regime of 100J@100 ns KrF laser pulses with a translucent PMMA targets at intensities up to 5×1012 W/cm^2. Channel formation mechanism includes self-consistent laser beam filamentation along UV light penetration depth. The modelling experiments with a preliminary drilled capillary channel and Monte Carlo simulations proved that the crown origin might be caused by an electron beam acceleration up to ~100 keV energies, which is much higher than the electron temperature of the plasma corona ~100 eV.

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