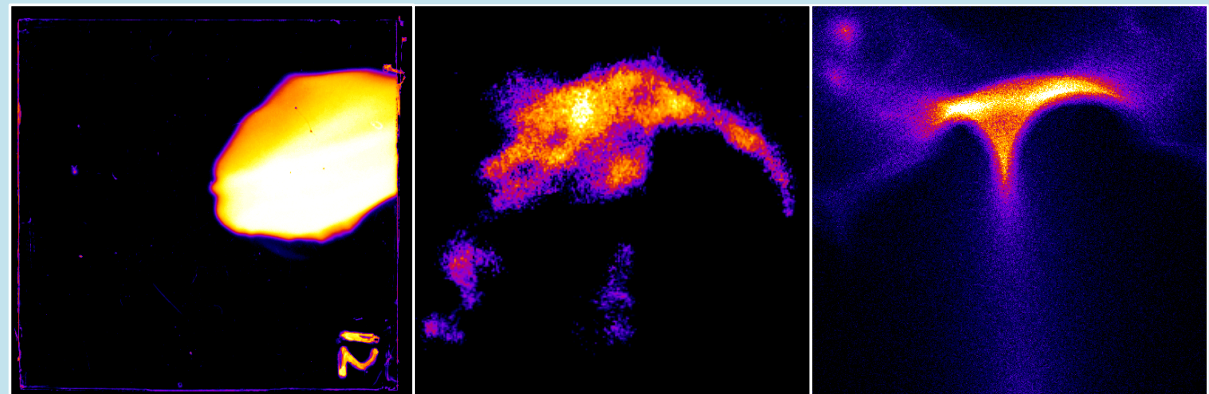
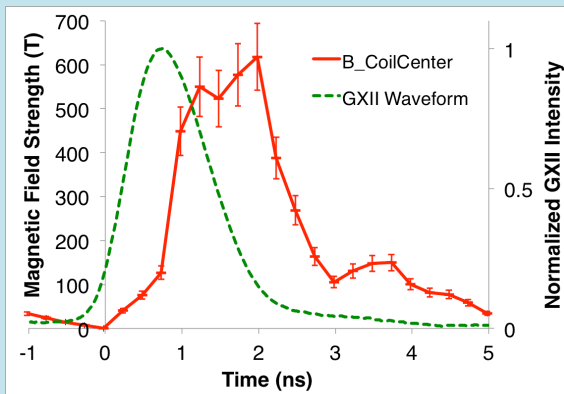


Measurement of external magnetic field in relativistic electron beam guiding experiment (King Fai Farley Law)



- In Fast Ignition Scheme of Inertial Confinement Fusion, collimation of relativistic electron beam by external magnetic field is proposed for improving heating efficiency.
- Kilo-tesla strong magnetic field is generated by a pair of laser-driven capacitor-coil targets.
- Time evolution of pulse magnetic field is measured by pick-up coil(B-Dot) method, by extrapolation using RADIA code.
 - 1.5ns FWHM
 - 620 ± 80 T peak strength
- $\sim 10^6$ extrapolation remain as a problem of pick-up coil method, so direct measurement of peak field strength by proton deflectometry is performed, with design improvements against plasma disturbance effects.
- By comparing with Monte-Carlo simulation results, peak magnetic field is estimated to be 610T.
- Two measurement methods gave consistent results, so that the kilo-tesla magnetic field characterization is now confirmed by a direct measurement on magnetic field strength.



Magnetic field time evolution measured by B-dot.

Experimental obtained proton signals without B field(Left), with B field(Center) and Monte-Carlo simulation result with B=610T(Right).