

# Sheath acceleration up to $5 \times 10^{21} \text{ Wcm}^{-2}$ @ Kansai Photon Science Institute

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- Upgraded J-KAREN-P → ~PW (30 J, 30 fs) on target
  - Commissioning expt.: sheath acceleration 250 TW,  $5 \times 10^{21} \text{ Wcm}^{-2}$
- Max. proton energy regularly > 40 MeV, up to ~54 MeV @ 2 μm foil
- Measured *sheath intensity scaling* @ ~0.1 Hz – increasing energy gives  $E_p \sim I_L^{1/2}$  scaling
- Electron temperature saturates* at ultra-high intensity & small focal spots → insufficient acceleration length

