

# Reconstruction of the longitudinal phase space for short electron bunches

Jens Schäfer for the FLUTE collaboration

# Concept

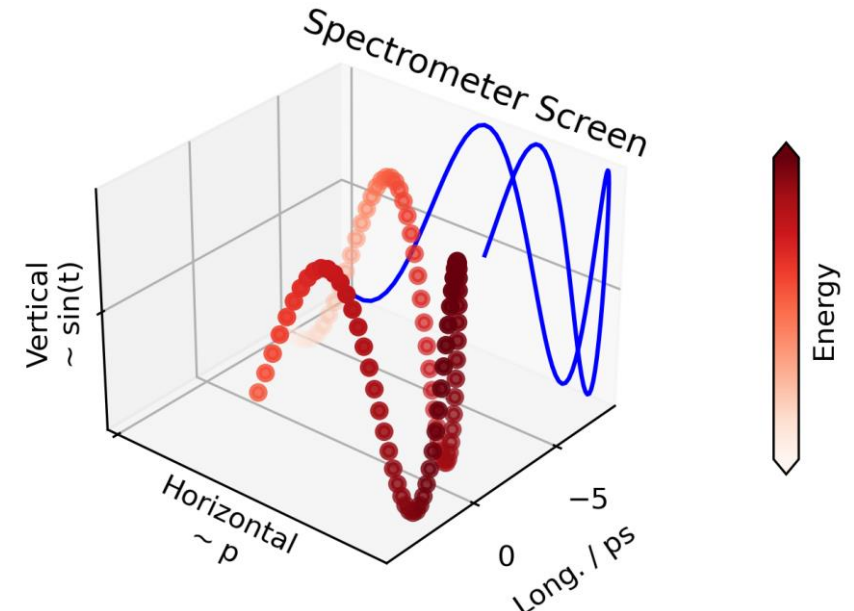
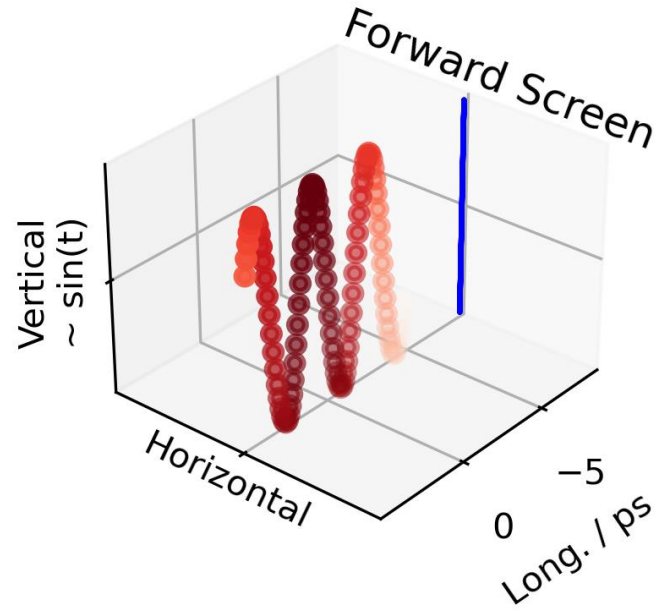
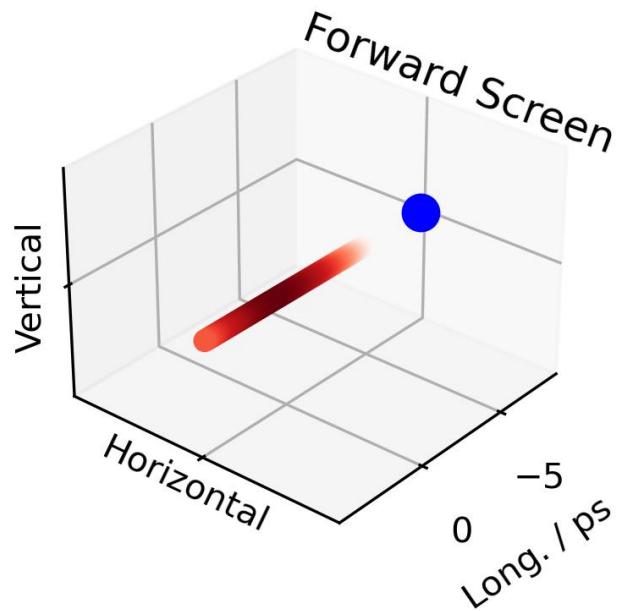
Bunch with  $\Delta p > 0$



SRR applies  $\Delta p_y \sim \sin(t)$

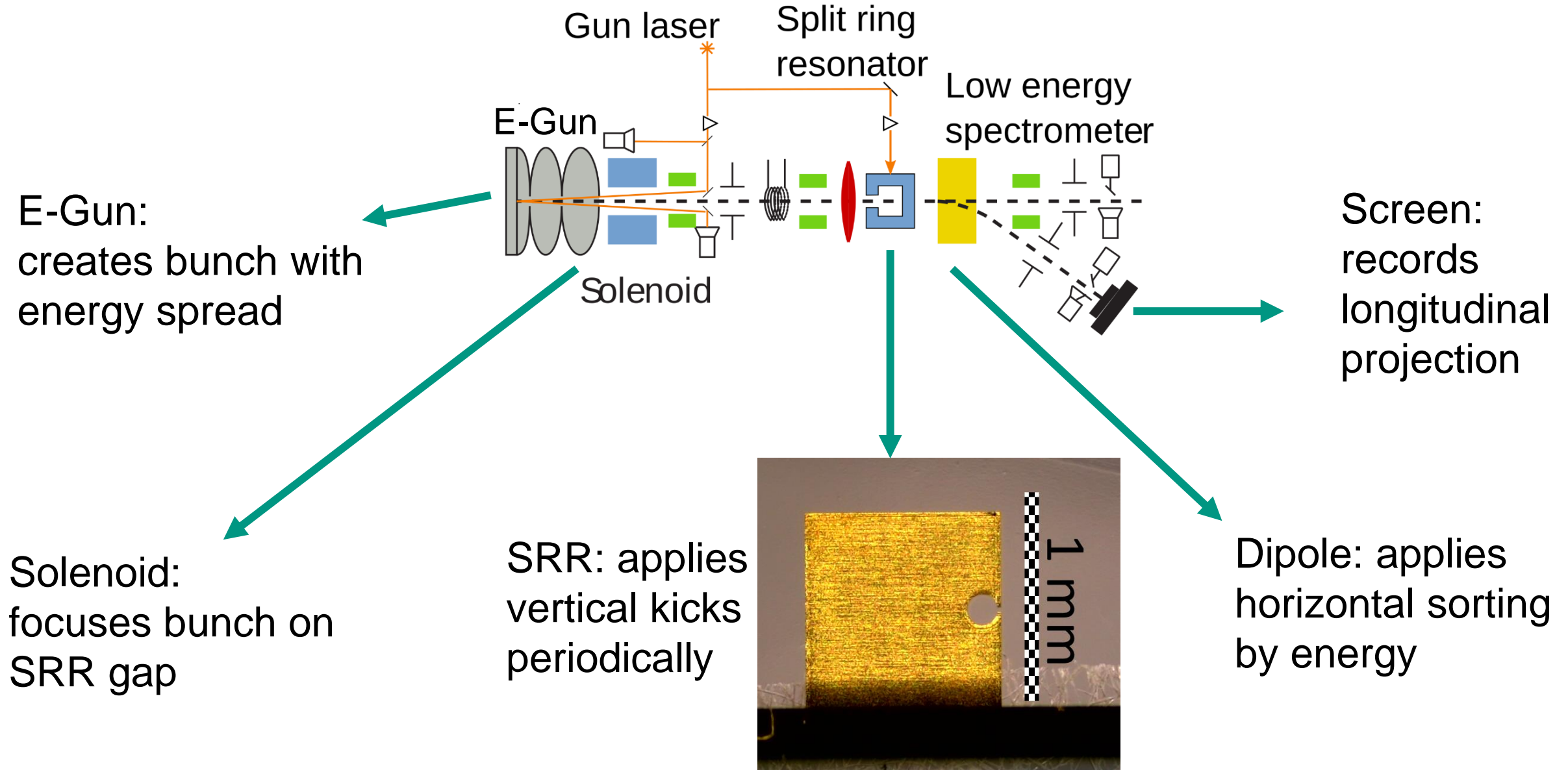


Dipole applies  $\Delta p_x \sim p$

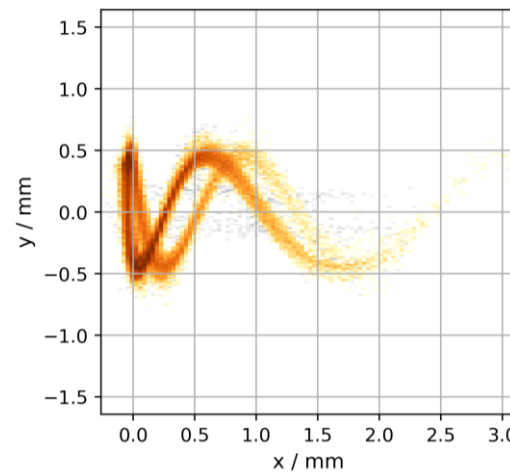


Screen image after SRR and spectrometer holds information of  $p$  in x-coordinate,  $\sin(t)$  in y-coordinate and charge in pixel intensity.

# Experimental setup



# Challenges

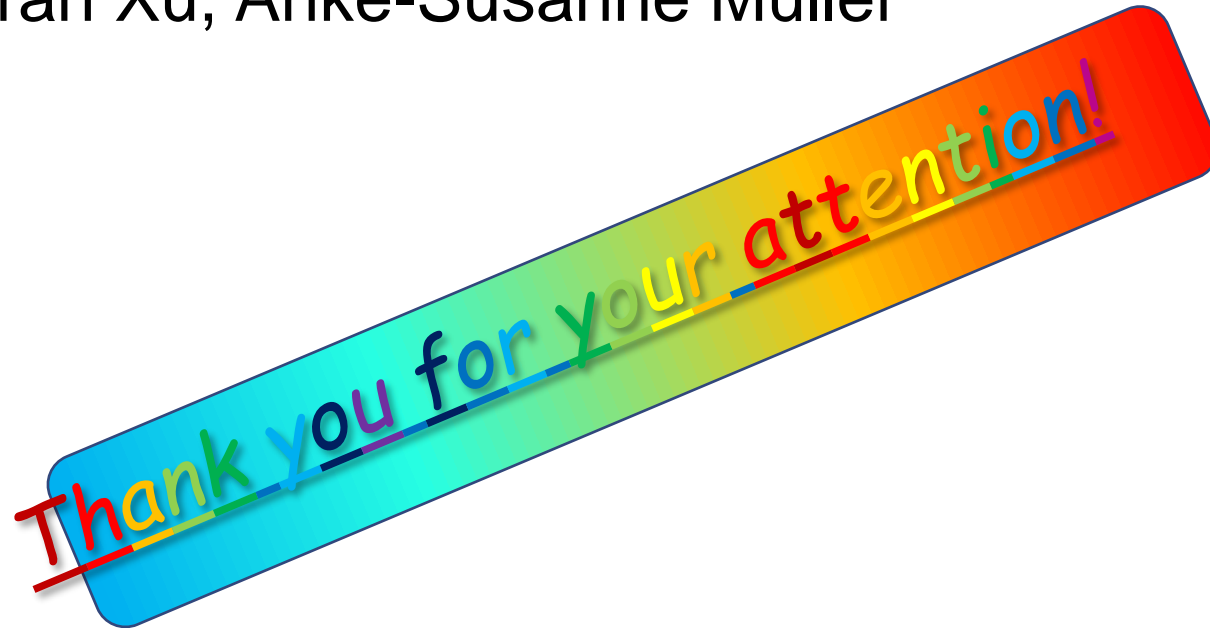


✓ Simulation of working principle

- SRR gap only  $20 \mu\text{m} \times 20 \mu\text{m}$ , e- outside of gap contribute to noise
- The required beam size sets tight boundaries to correct aiming, beam parameter, jitter etc.
- The THz pulse is difficult to handle, steer and measure Talk by M. Nabinger
- Data analysis tool for phase space reconstruction for looped screen images under development

# Acknowledgment to the FLUTE collaboration:

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Thank you for your attention!