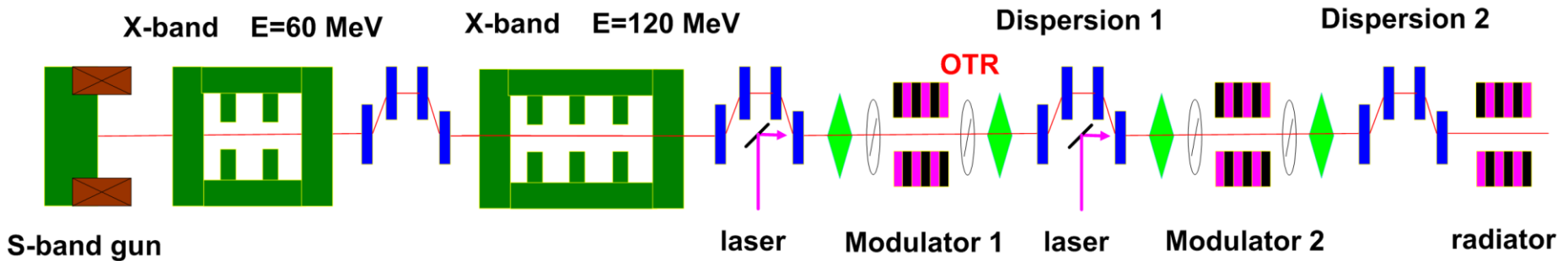


# ❑ Coherent undulator & OTR radiation observed during the Echo-7 commissioning at NLCTA SLAC (D. Xiang et al.)

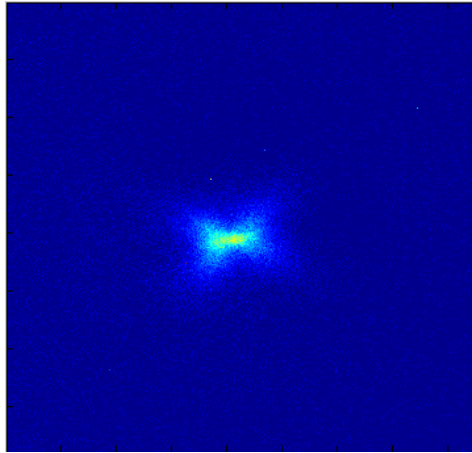


## Echo-7 beam line at NLCTA

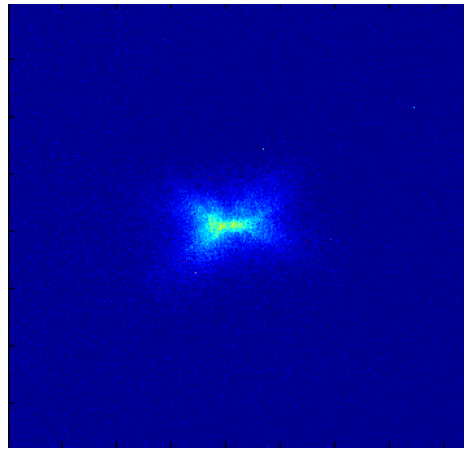
Beam energy	120 MeV
Beam charge	40 pC
$\epsilon_n$	8 mm mrad
$R_{56}^{(1)}$	74 mm
$R_{56}^{(2)}$	5.5 mm
$R_{56}^{(3)}$	3.2 mm
$R_{56}^{(3)}$	1.2 mm

- ❖ Run the x-band off crest and the bunch is compressed after the second/third/forth chicanes
- ❖ Four-chicane system has potentially high microbunching gain
- ❖ Coherent undulator radiation and COTR observed at the OTR screens when x-band is 30~60 degrees off crest
- ❖ The enhancement factor of the radiation intensity is ~50 at maximal compression

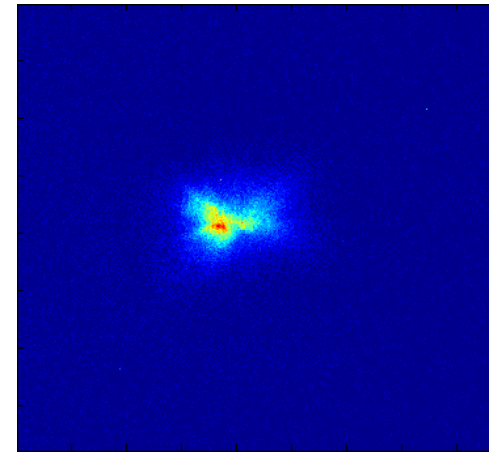
## □ Representative beam images at the OTR screen



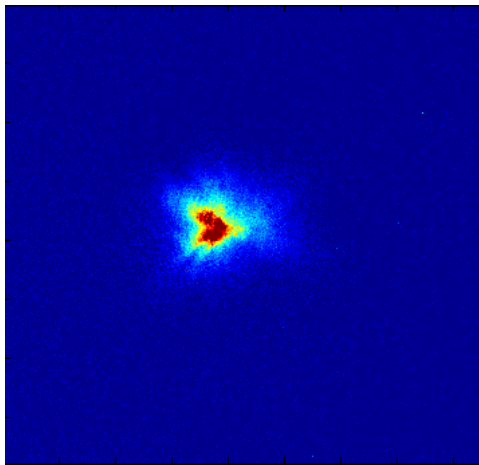
90°



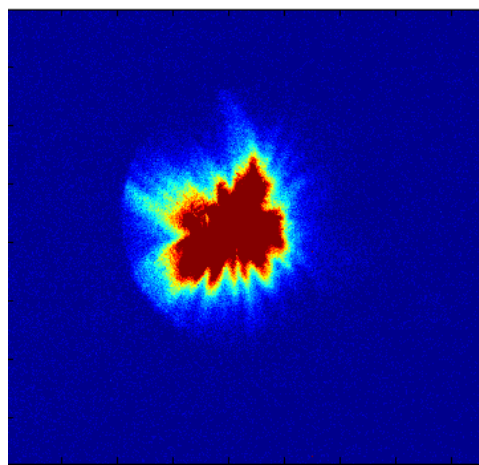
59°



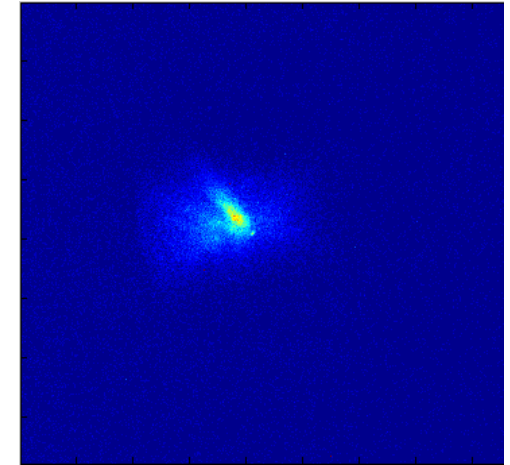
51°



47°



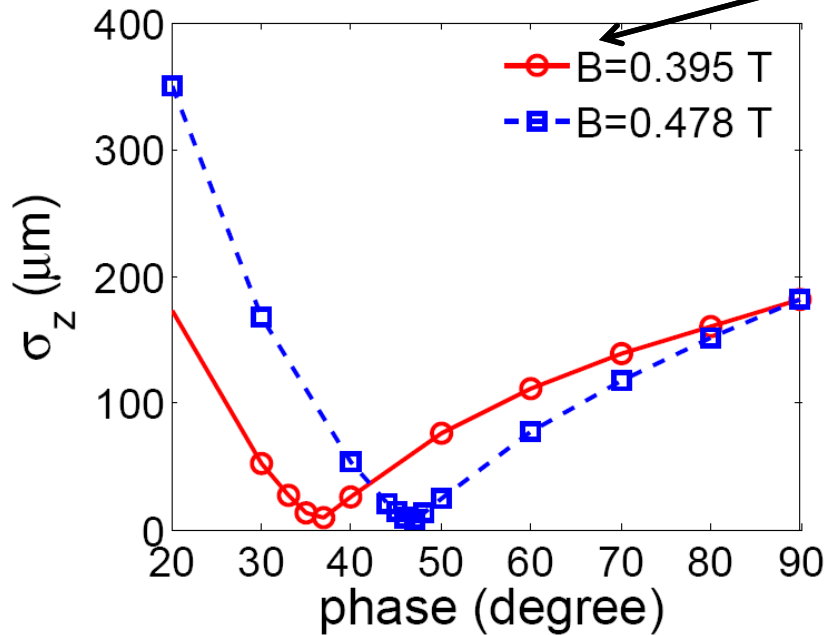
43°



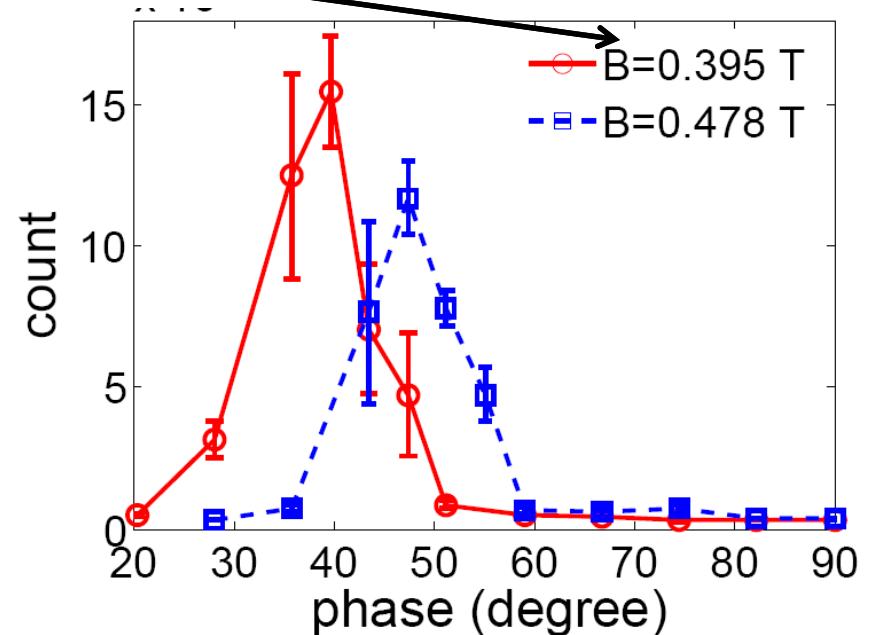
28°

## □ CUR & COTR radiation

second chicane



Simulated bunch length



Measured coherent radiation intensity

- ❖ Radiation intensity at OTR screen is measured as a function of station 2 phase for two different chicane settings
- ❖ Maximal enhancement (40 pC) is about 50
- ❖ Radiation intensity is maximal when bunch length is minimal ( $\sim 9\text{ }\mu\text{m}$  rms)