Discussion

THz@CLEAR

THz Generation

- CTR using 0.5nC and bunch length of 100fs : peak power of few uJ
- CDR using parabolic target
- Enhanced spectrum using sub-picosecond bunch train structure
  - more monochromatic spectrum
- Smith-Purcell
  - Reaching high-average power with LEETCHI
  - Using e-gun may be limited to frequencies smaller than
  - 300W to kW in fundamental
- Cherenkov in Meta-materials
  - Possibly working on LEETCHI and CLEAR

Simulating different scenario

- To be done for CLEAR
  - Comparing TR, DR, Smith-Purcell, Cherenkov or Cherenkov DR
- To be done for LEETCHI
  - Comparing SP and Cherenkov
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Beam Tests

- On CLEAR
  - Testing Coherent radiation from TR, DR, Smith-Purcell, Cherenkov or Cherenkov DR
  - Measuring peak power for single bunch
- On LEETCHI
  - Need new hardware and modifications of the beam line
  - Possibly testing CSP or Cherenkov

THz Detection

- EO SD or EO up-conversion for short bunch length
- EO Spectral decoding
- We have equipments to test up to 100GHz
  - for shorter wavelength we need new detectors – pushing the tests in 2018

CLEAR and LEETCHI

- What beam parameters ?
  - For CLEAR, Bunch length ? Trains ?
  - For LEETCHI : Beam energy? Current ?

- Infrastructure needed to carry our beam tests
  - Synergy with other experiments
  - Missing hardware
    - Solenoid and Experimental chamber for LEETCHI
    - Specific beam manipulation: RF deflector, scraper,

- When would the test be ready to be performed and how much beam time is needed ?

- What contribution to expect from external partners ? Material and Manpower,

THz applications

- Applications
  - In science
    - Identification of chemical component
    - Measuring permeability
    - Transient phenonema
  - In Security – detection of explosive, drug
  - In inspection for Food quality / pharmac product
- Generation
  - Using laser – 1u
  - Using SR – higher flux and wideband
  - Using laser induced breakdown in air