LhARA Meeting

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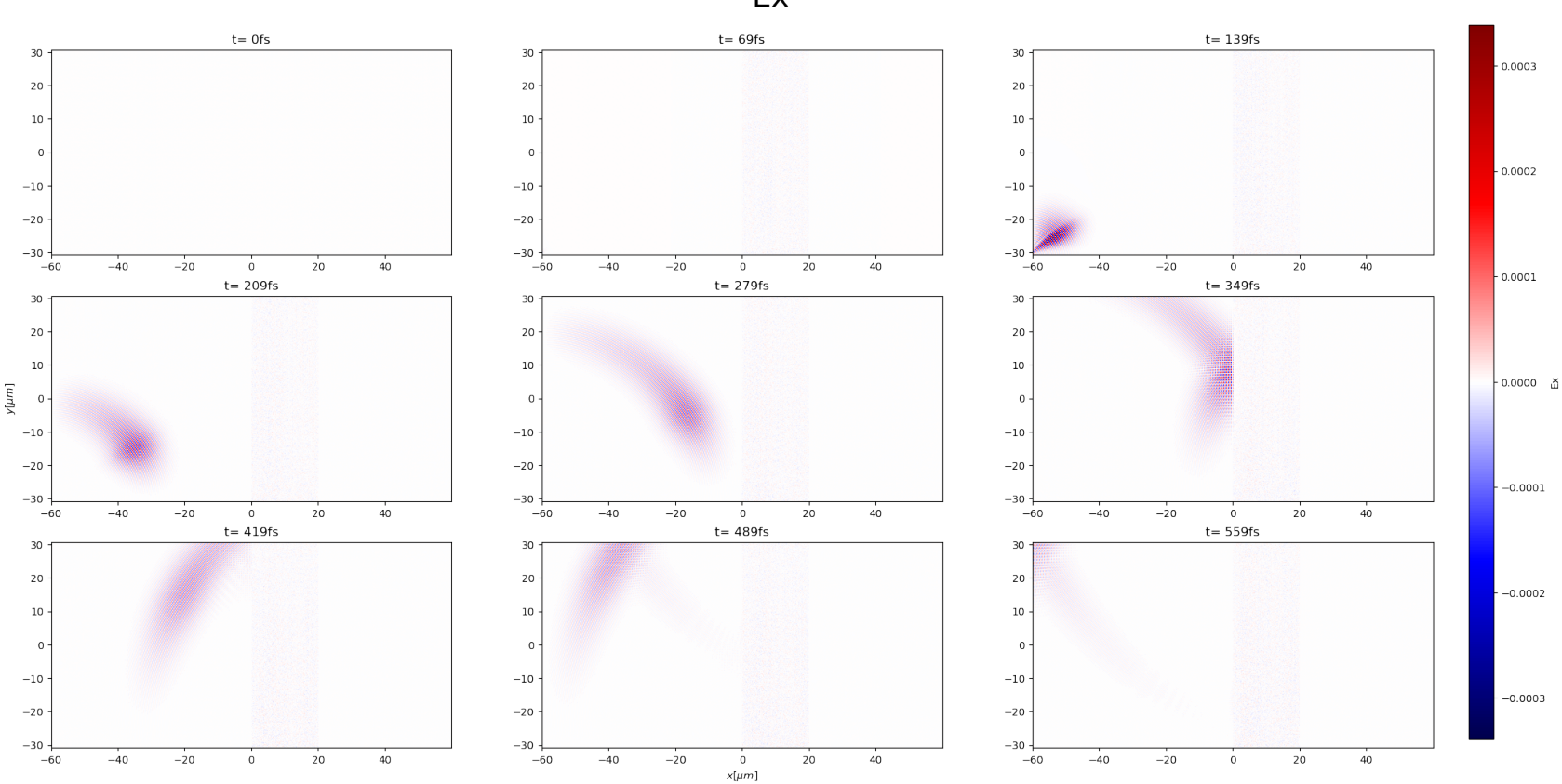
Smilei Simulations

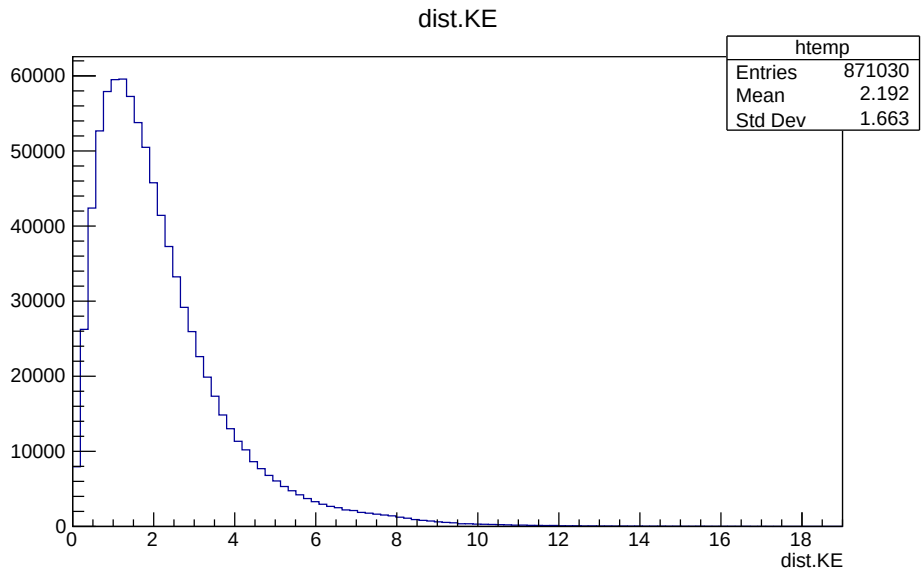
Simulate laser incident on a thin foil to generate beam.



2D Simulation Macro-particle tracking

Some Simulation Parameters

- Box Size = 80 μm $\times$ 60 μm
- Cell Size = 10 nm $\times$ 20 nm
- Particle per cell = 4
- Foil Size = 20 μm $\times$ 40 μm
- Laser energy = 2.5 J
- Laser pulse length = 25 fs
- Focal spot FWHM = 3 μm

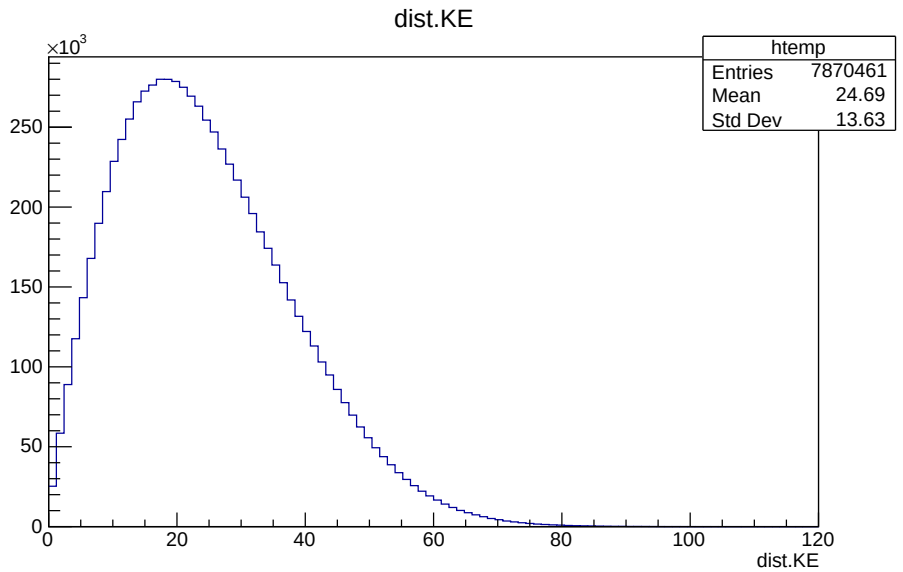


KE spectrum seems to have correct shape. About 0.01% of the protons (macro-particles) leaving foil have energy in range of interest.

3D Simulation Attempt Macro-particle tracking (low resolution) – possible issues

Some Simulation Parameters

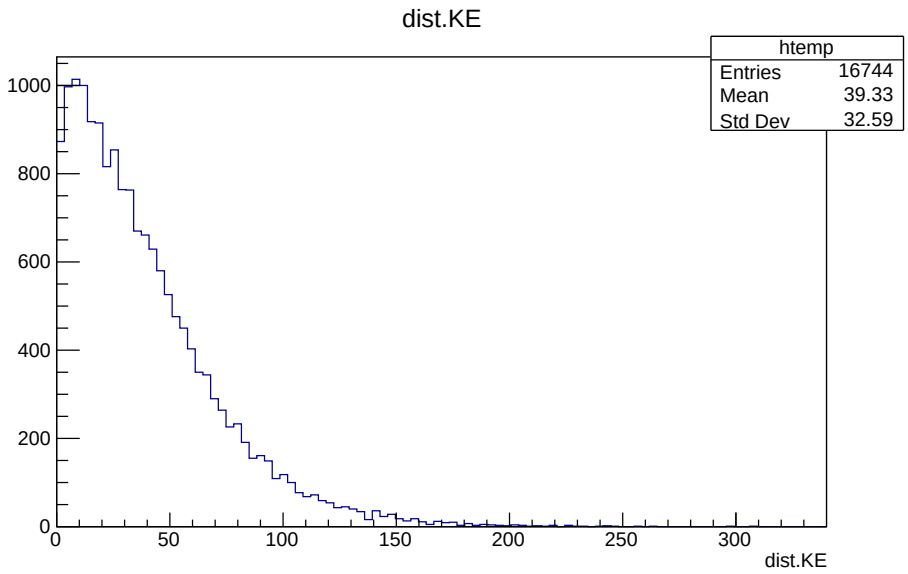
- **Box Size** =
  $80\,\mu\text{m} \times 40\,\mu\text{m} \times 40\,\mu\text{m}$
- **Cell Size** =
  $80\,\text{nm} \times 100\,\text{nm} \times 100\,\text{nm}$
- Particle per cell = 4
- Foil Size =
  $20\,\mu\text{m} \times 40\,\mu\text{m} \times 40\,\mu\text{m}$
- Laser energy = 2.5 J
- Laser pulse length = 25 fs
- Focal spot FWHM = 3 μm



2D Simulation low resolution check

Some Simulation Parameters

- **Box Size** = 80 μm $\times$ 40 μm
- **Cell Size** = 80 nm $\times$ 100 nm
- Particle per cell = 4
- Foil Size = 20 μm $\times$ 40 μm
- Laser energy = 2.5 J
- Laser pulse length = 25 fs
- Focal spot FWHM = 3 μm



To be investigated.