

Stefano/Bart

### Tests in August

- Have sent numbers on the PHIN beam to Lawrence.
- Looks like PHIN will give approximately 50 times more electrons per unit area than in AWAKE, given the higher charge and smaller beam size.
  - > Need to look at photons per electron to know exactly how the light yield compares. Part of Lawrence's simulations, see later.
  - Useful for detailed studies, but will also want some attenuation to have light yields similar to AWAKE.
  - > To find out thickness and material of vacuum window to see how compares with that planned for AWAKE.
- Have 300 mm lens which should be okay.
- Have identified support for camera; some modifications needed, but basic structure okay.
- Still no precise schedule
  - > Need camera end of July, so UCL should ship soon.
  - > Send one of the spare lanex sheets to CERN.

### Alternative to optical mirror line

- Had discussions with other people in CERN and considering fibres. UCL group have also thought about this, but the issues are number of channels, particularly for a 2D screen, and expense.
  - Potential to use plastic fibres which can be made at CERN. They are, however, not radiation hard, so need to investigate whether they could be used in AWAKE area.
  - Quartz, or other more rad-hard solutions are expensive, and cannot be done at CERN.
  - Possibility of fibres attached to screen or have a scintillating fibre detector; tapered fibre optic bundle?
- > CERN to continue to look into, currently as a back-up solution.

Lawrence/Matthew

### Test in August

- As there are >2000 bunches, potentially have even more light (100000 x AWAKE) or use single-bunch mode. Questions arising from Lawrence's work:
  - > Can we run in single-bunch mode?
  - > Will we have a light-tight enclosure? How dark is the area? If we use one bunch, the amount of light is a fraction of 60 W light bulb.
  - > What is the radiation environment? As the camera will be 20 m away, it should be safe, but need to check.
  - > The beam size is 10 x 30 mm<sup>2</sup>. Can it be smaller by removing diagnostic screens along the beamline? Do we want to do that?
- Currently have four 10 cm x 10 cm lanex screen (samples) at UCL.
- Considering different options for supporting the lanex screen which is not rigid enough to be vertical with no support. Considering clamping and providing tension or mounting on a rigid material.
  - > Will probably consider more than one solution and test both in the August tests.
  - > Looking at simulations having backing material and effect on light output. This will also provide details on the light output for a 5.5 MeV beam versus the higher energy GeV beam expected for AWAKE,

### Overall simulation

- AWAKE simulation running with diagnostic screens between plasma and spectrometer included.