

Detailed Run Plan for the CDH Beam Test on May 16, 2015

Phantoms (Abbrev.)

- ☐ Calibration Phantom (Calib/0) mounted on platform
- ☐ 4 additional polystyrene plates (100 x 400 x 50.8 mm each)
- ☐ Alignment (rod) phantom (Rod)
- ☐ Water Phantom (Water)
- ☐ CTP528 High Resolution Line Pair Phantom (Linepair)
- ☐ CTP404 Sensitometry Phantom (Sensitom)
- ☐ CTP515 Low Contrast Module (LowCon)
- ☐ CIRS Edge Phantom (CIRSEP)
- ☐ HN715 CIRS Pediatric Head Phantom (CIRSPHP_0)

Experimental Setup

The phase II pCT scanner will be mounted on a bread board, which will be placed on a platform mounted to the robotic positioner in the uniform scanning room at CDH.

The pCT system center will be placed at room isocenter user room alignment lasers. Lateral alignment will be done approximately by eye (for now).

We will run with a 200 MeV proton beam of 4 cm (FWHM) spot size, uniformly scanned using wobbler magnets to the field sizes specified below (at 50% isodose).

The beam intensity will be adjusted the night before the proper runs to approximately 1M protons per sec and spot. Time variations of +/-10% are acceptable.

Run Plan

1. Stepped Scans (stop beam after each projection, transfer data, restart beam for new projection)

- ☐ Empty run: 4-5 M histories, field size 12 cm x 36 cm
- ☐ Calibration run: 4-5 million histories per brick (0, 1, 2, 3, 4 bricks), field size 12 cm x 36 cm
- ☐ Water phantom: one projection, 4-5 M histories, field size 4 cm x 16 cm
- ☐ CIRS Edge phantom (CIRSEP): 90 projections, 4 deg intervals, 4-5 M histories per projection, field size 8 cm x 24 cm
- ☐ CIRS head phantom: superior and inferior run, each run 90 projections, 4 deg intervals, 4-5 M histories per projection, field size 12 cm x 24 cm
- ☐ Water Phantom (Water): 90 projections, 4 deg intervals, 4-5 M histories per projection, field size 4 cm x 16 cm
- ☐ CTP404 Sensitometry Phantom (Sensitom): 90 projections, 4 deg intervals, 4-5 M histories per projection, field size 4 cm x 20 cm

- ☐ CTP528 High Resolution Line Pair Phantom (Linepair): 90 projections, 4 deg intervals, 4-5 M histories per projection, field size 8 cm x 20 cm
- ☐ CTP515 Low Contrast Module (LowCon): 90 projections, 4 deg intervals, 4-5 M histories per projection, field size 8 cm x 20 cm
- ☐ Alignment (rod) phantom (Rod): 90 projections, 4 deg intervals, 4-5 M histories per projection, field size 4 cm x 20 cm

2. Radiography Scans:

Data will be acquired in two projections at orthogonal angles (0 deg, 90 deg) to allow for reconstruction of radiographs

- ☐ CIRS head phantom: superior and inferior projection, each 2 projections, 90 deg intervals, 8-10 M histories per projection, field size 12 cm x 24 cm
- ☐ CIRS Edge phantom (CIRSEP2): 2 projections, 90 deg intervals, 8-10 M histories per projection, field size 8 cm x 24 cm

3. Continuous Scan

This will be done to obtain first experience with a continuous run mode.

- ☐ CTP404 Sensitometry Phantom (Sensitom): 90 projections, 4 deg intervals, 4-5 M histories per projection, field size 4 cm x 20 cm