



medPhoton G.m.b.H.



ebg *MedAustron*

Proof of Concept: PAIR – Patient Alignment Imaging Ring

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Overview

Specifications:

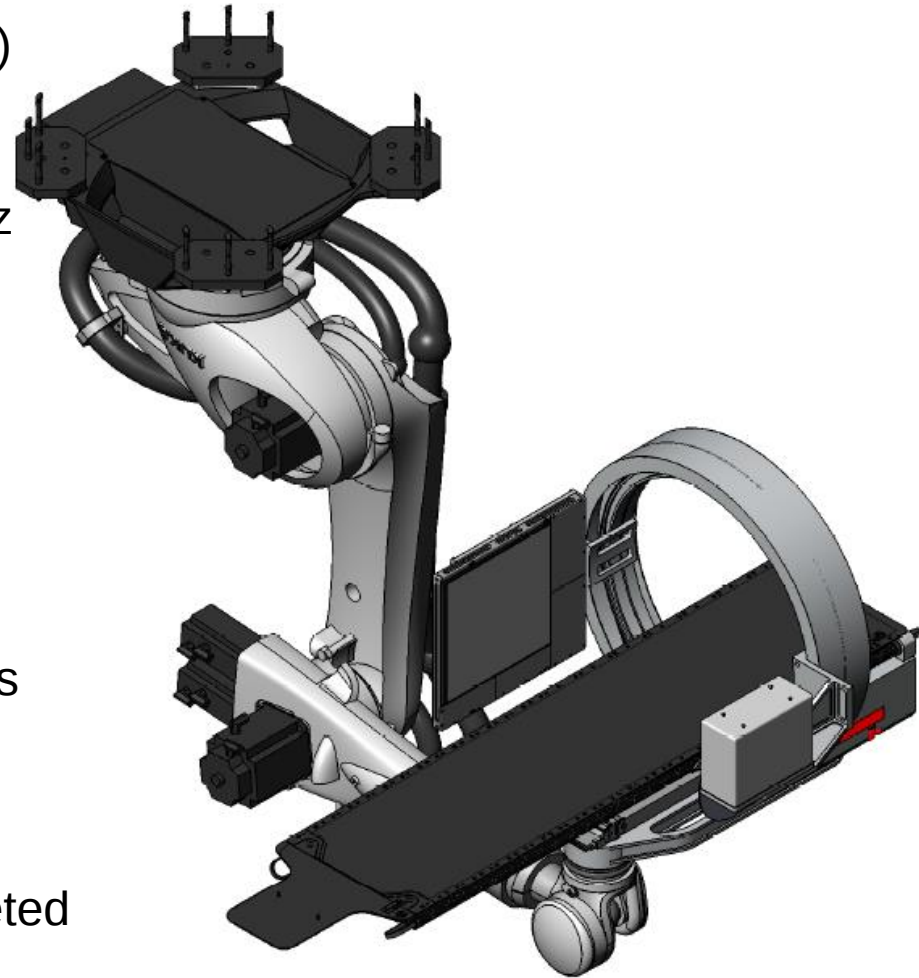
max. patient load 200 kg (robot limit 350 kg)
optically tracked: 0.5 mm / 0.1° absolute
large clearance 78 cm bore
Detector 40x40 cm 200 μ m pixel 10 – 30 Hz
X-Ray 40 kV – 120 kV 30 Hz monotank
(supply 380 V 20 kHz)

IGRT:

significantly faster volumetric imaging
(CBCT >5 rotations per min)
Ultrafast 2D-3D registration capabilities
real time motion compensation opportunities
Dual energy options

Forecast:

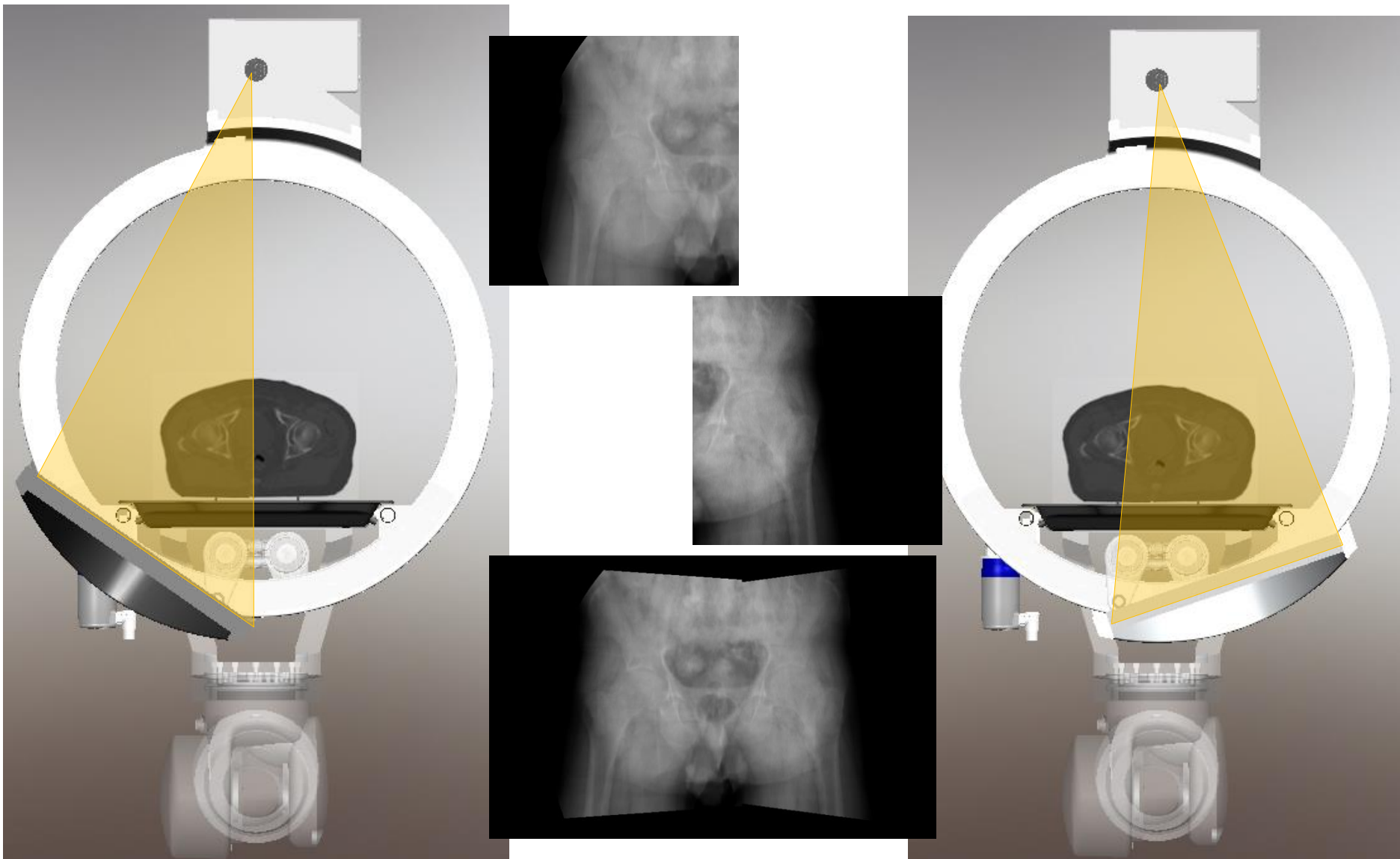
June 2013: mechanical engineering completed
(prototype working)
2014-2016: 4 systems installed at MedAustron



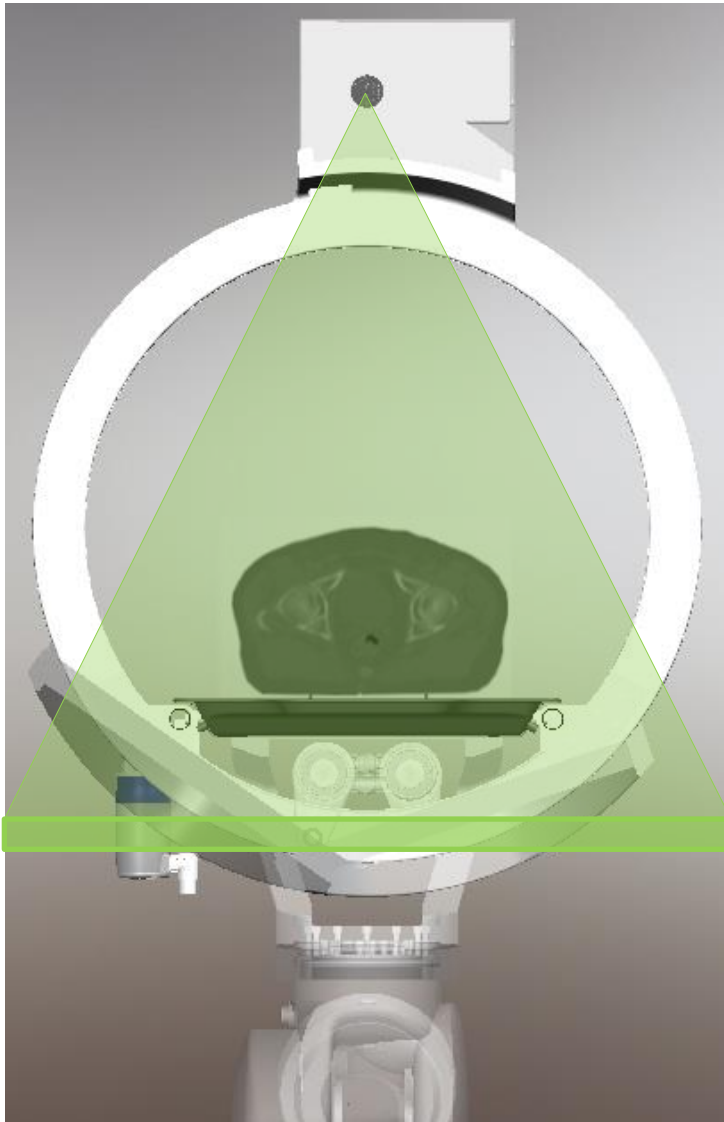
1st assembly @ MedAustron: PAIR [Jun 10, 2013]



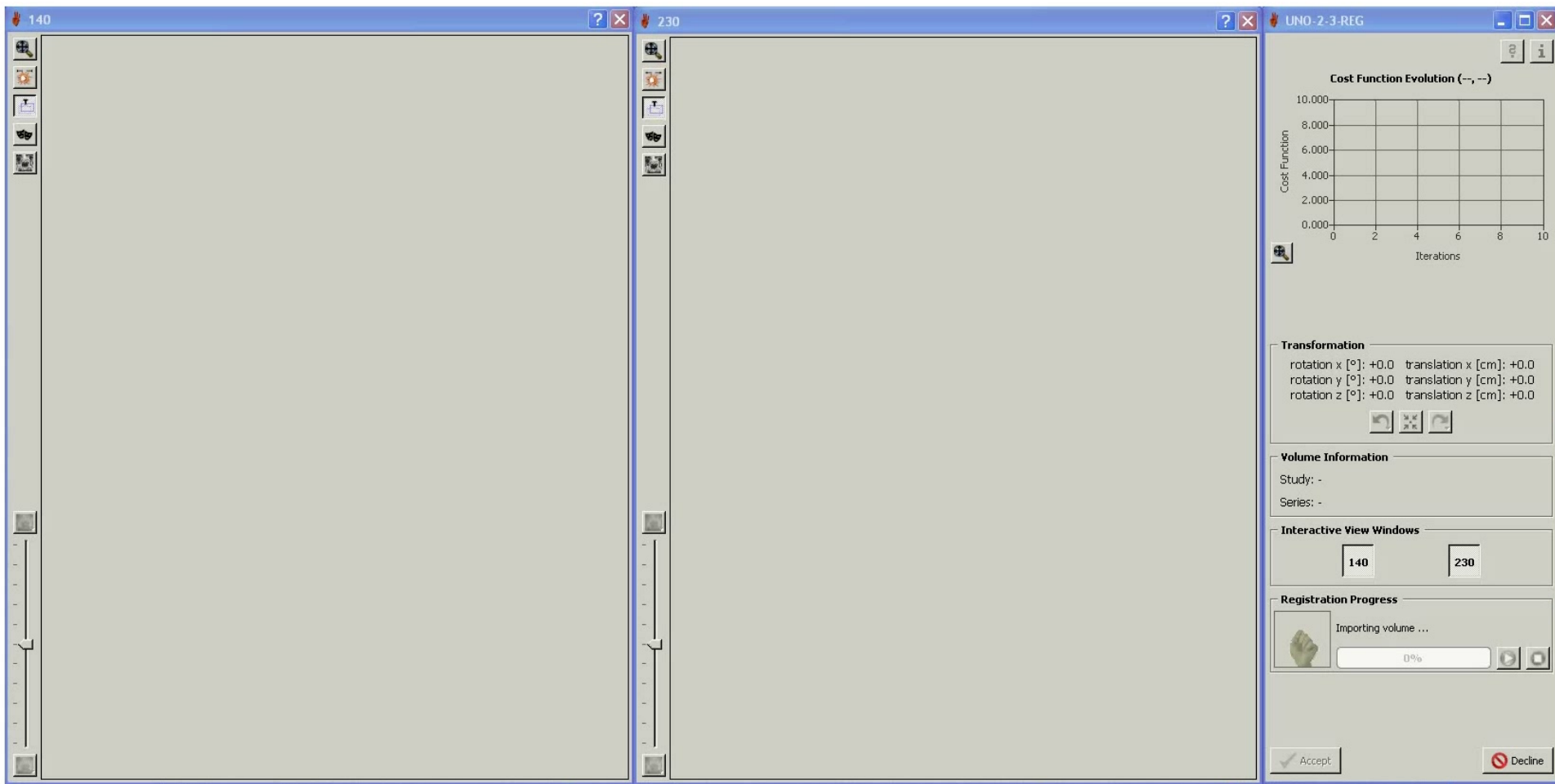
Large FOVs: automatic image stitching



Large FOVs: automatic image stitching



Fast 2D/3D image registration with planar images



Dual-energy: contrast enhancement

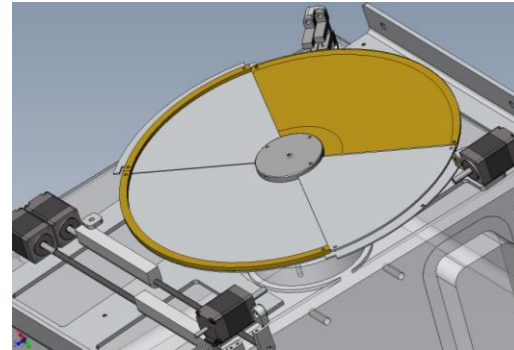
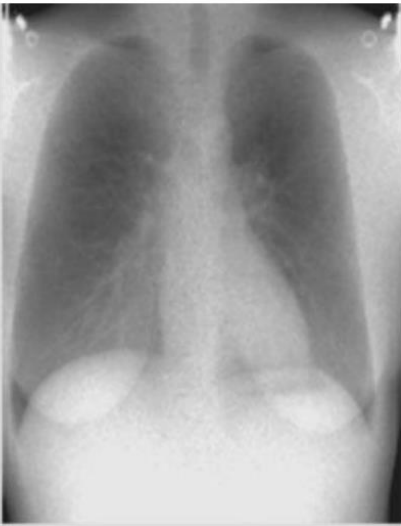
60 kV (1st pulse) 120 kV (2nd pulse)



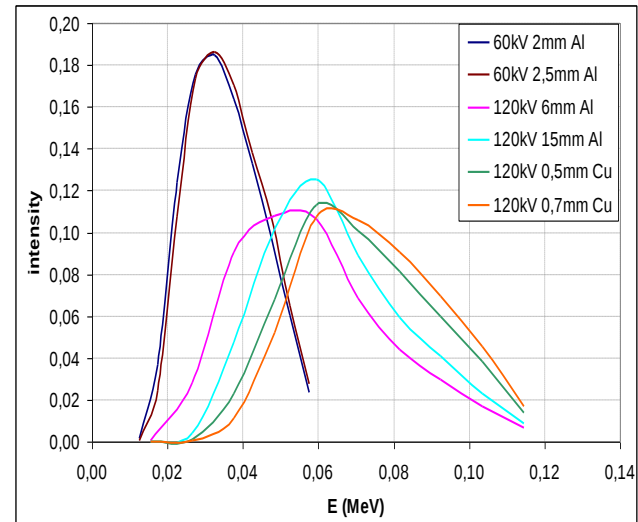
Img1



Img2

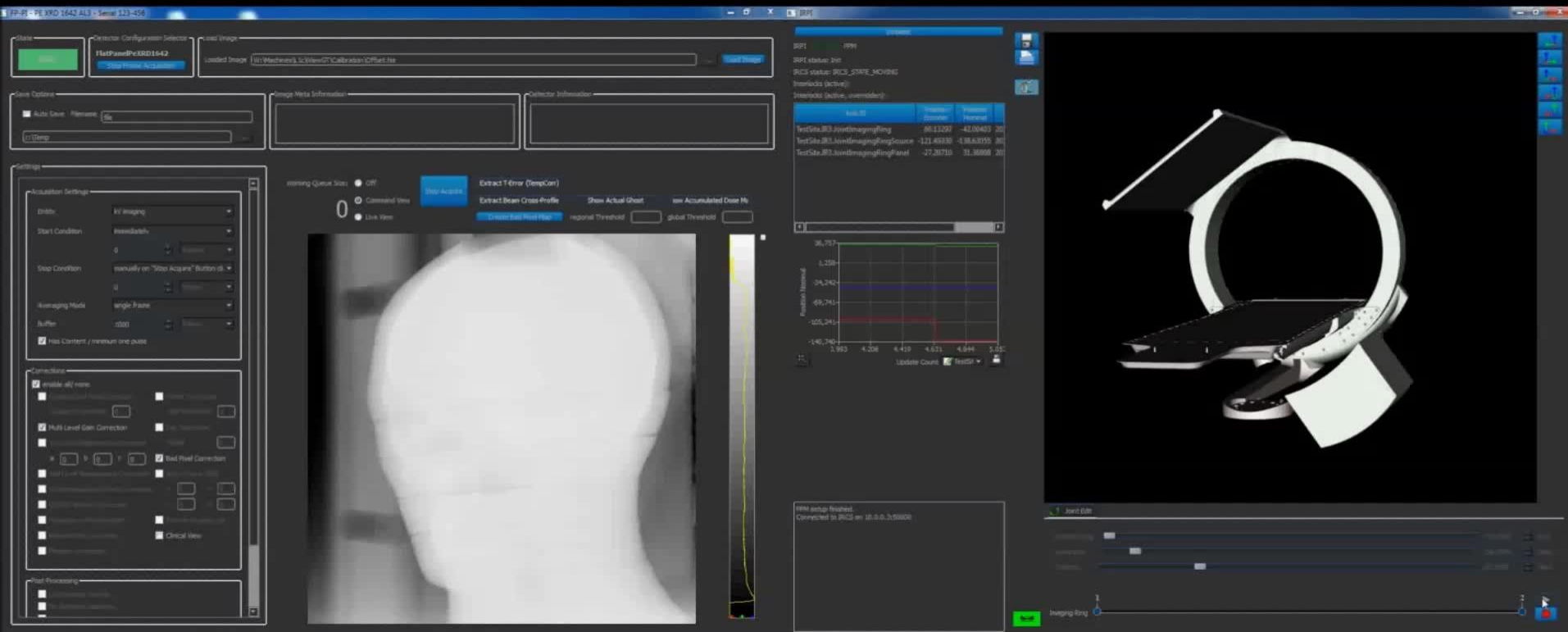


@ 10 Hz

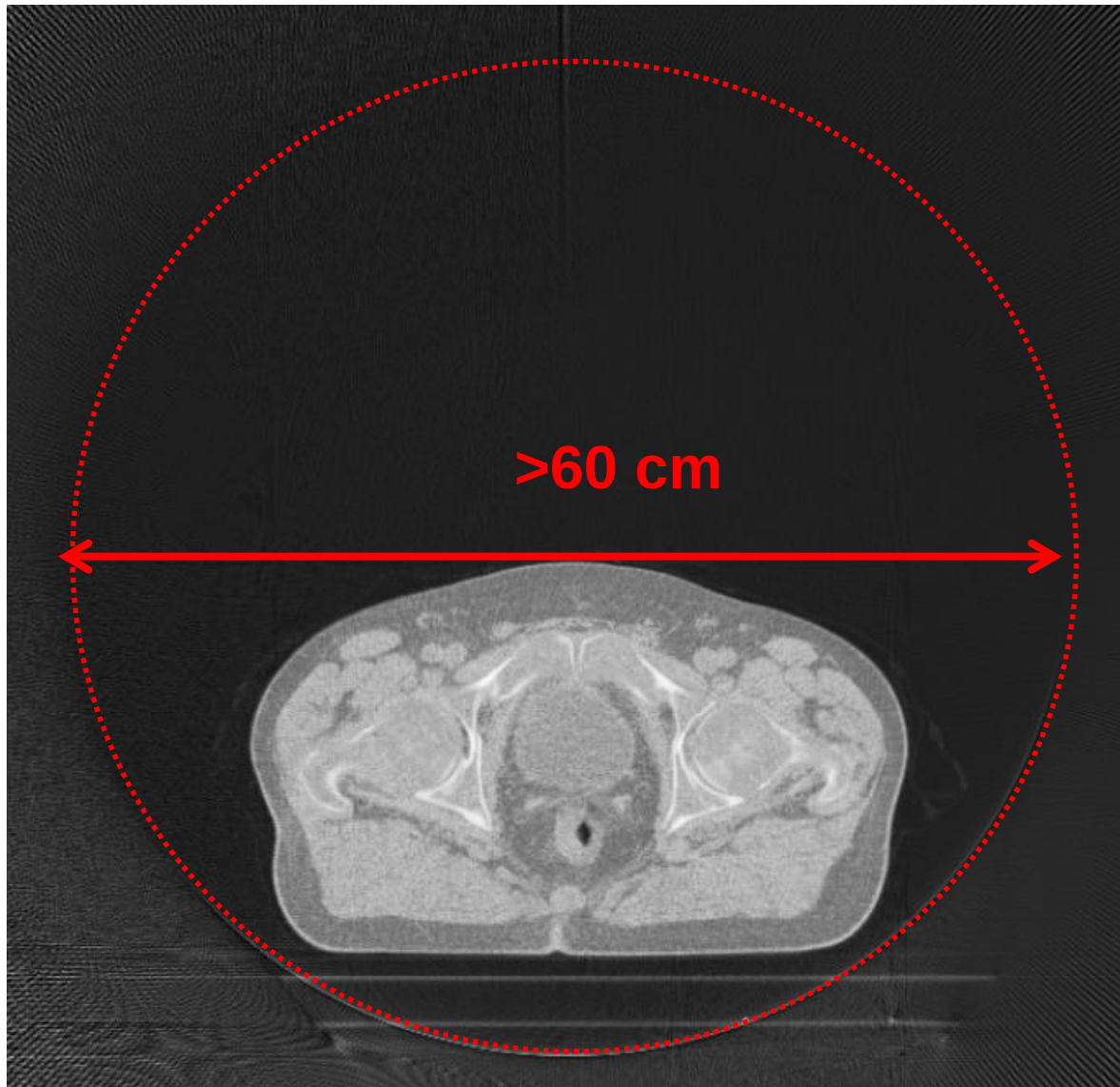


$$(Img2 * 2 - Img1 * 1) * k1 \quad (Img1 * 2 - Img2 * 3) * k2$$

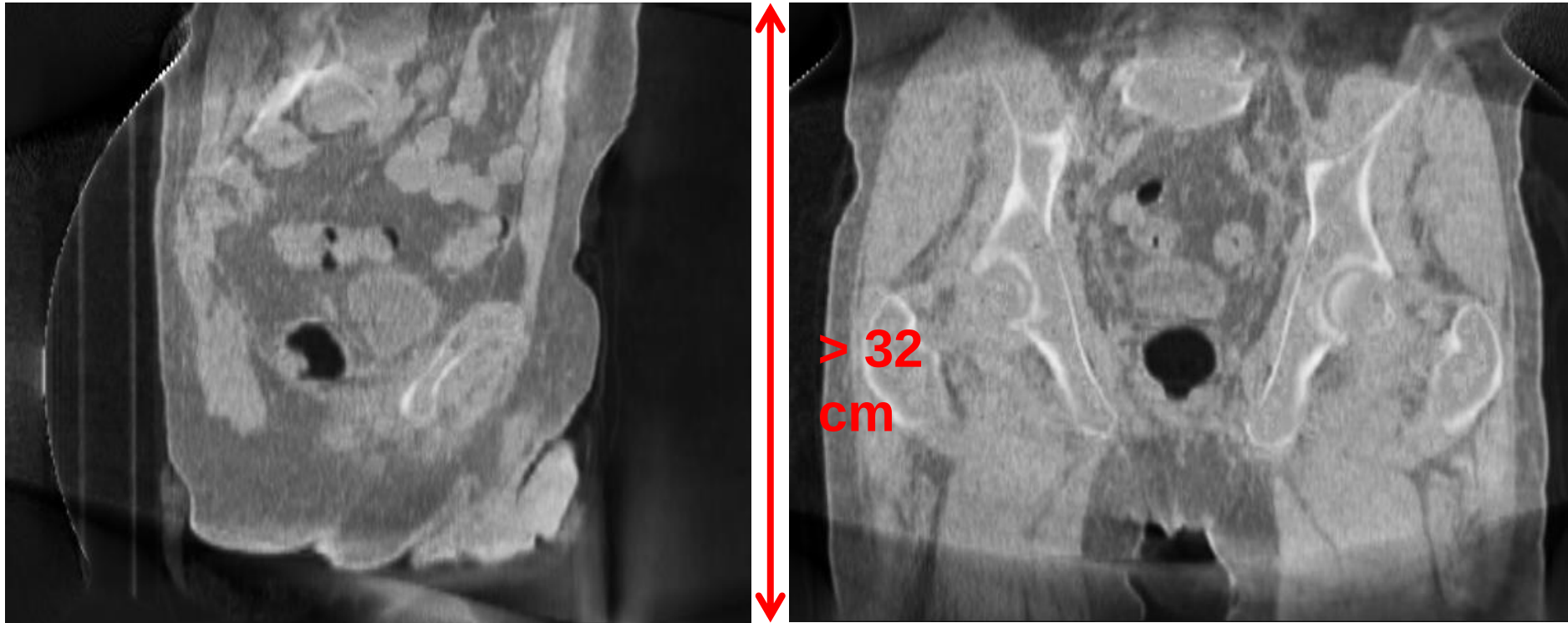
Cone-beam CT acquisition with the imaging ring



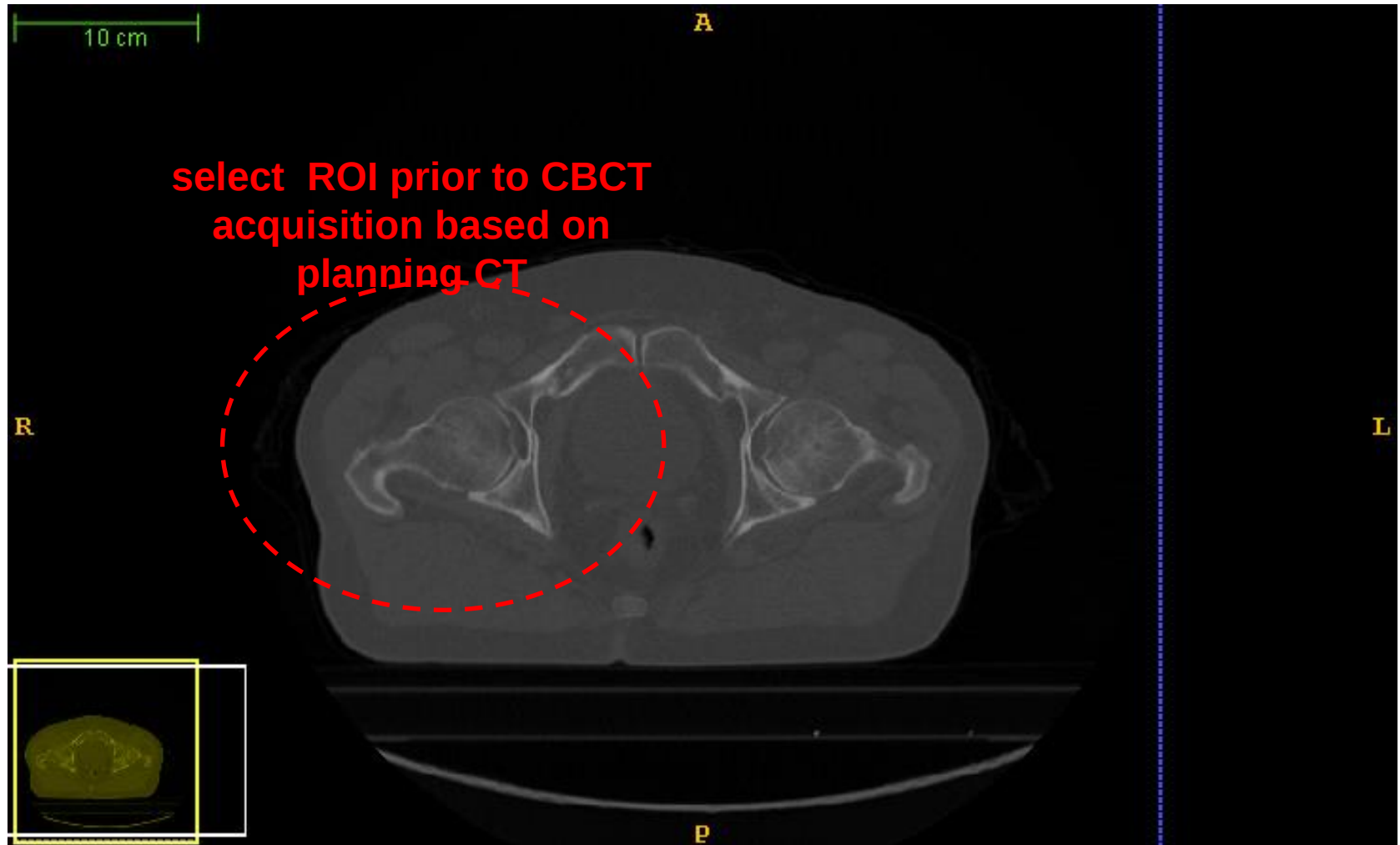
Large FOV CBCT



Large FOV CBCT



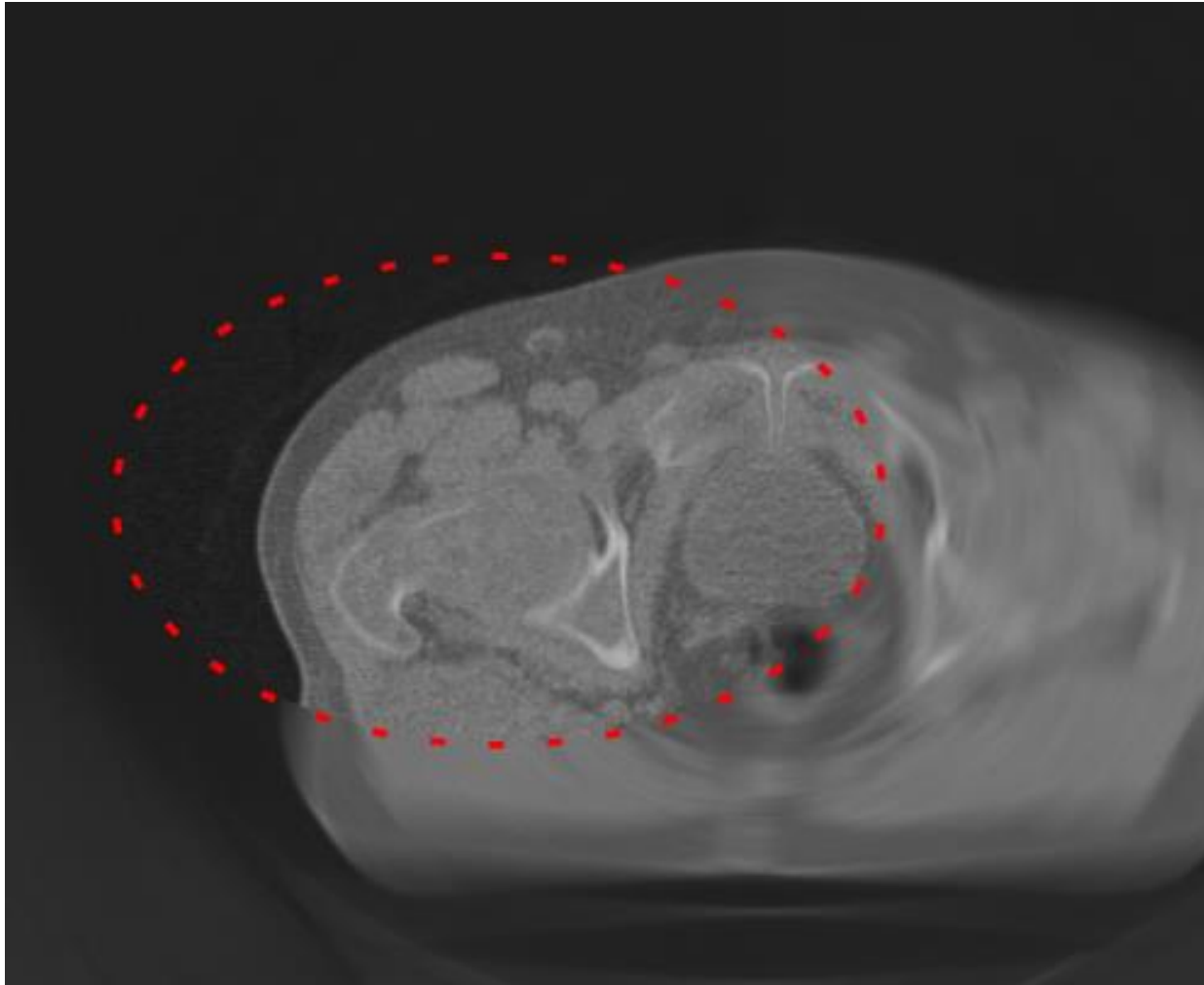
Dose reduction in CBCT acquisition



Dose reduction in CBCT acquisition



Dose reduction in CBCT acquisition



Thanks for the attention



Proof of concept, June 2013, Salzburg (AUSTRIA)