SCANDITRONIX WELLHÖFER
Member of the IBA Group

StarTrack

AK IMRT Heidelberg März 07

Salih Arican
Product Manager RT

FASTest | mostACCURATE | mostRELIABLE

Top 3 customer pains....

Need for accuracy

Economics

Lack of time

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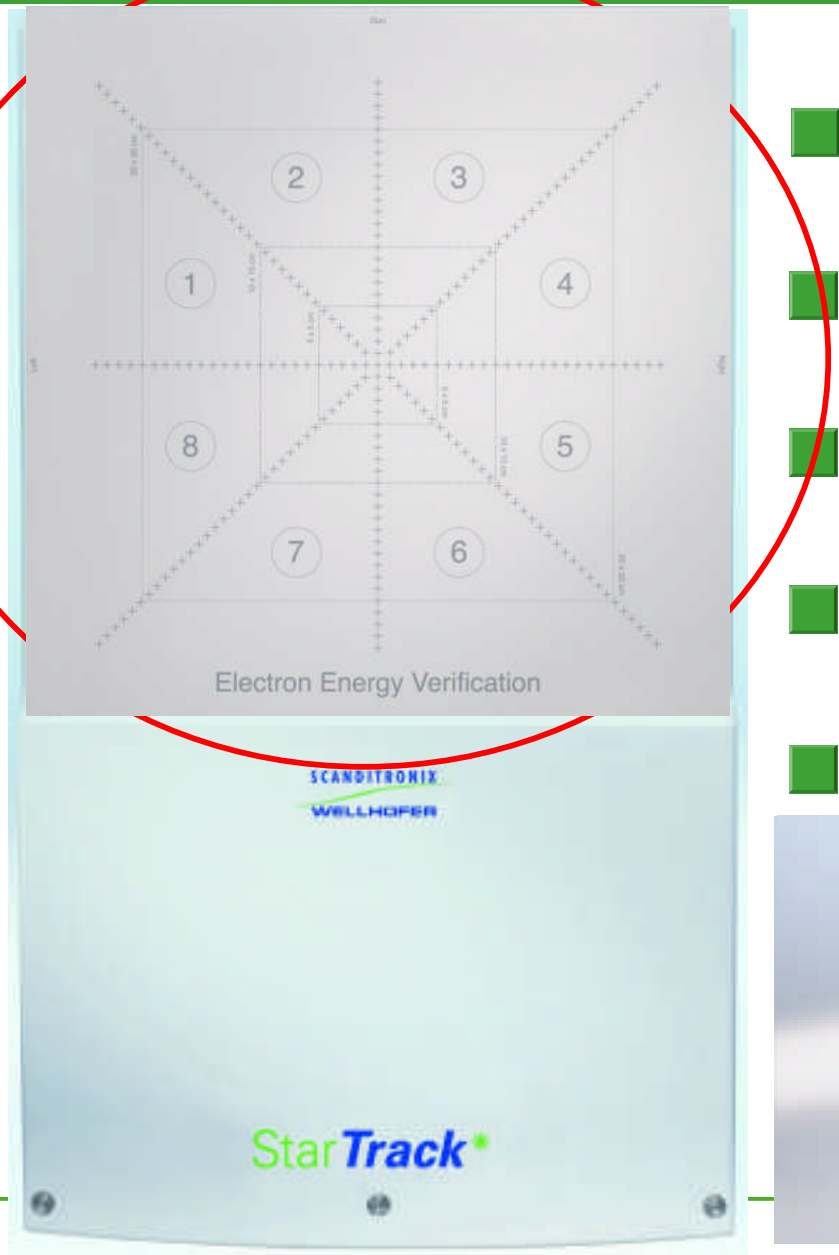
StarTrack →The universal QA solution



- Air-vented pixel Ionization chambers
- Main axis and diagonals
- Additional rows for MLC QA
- Additional chambers dedicated to energy constancy verification
- 2 build up plates

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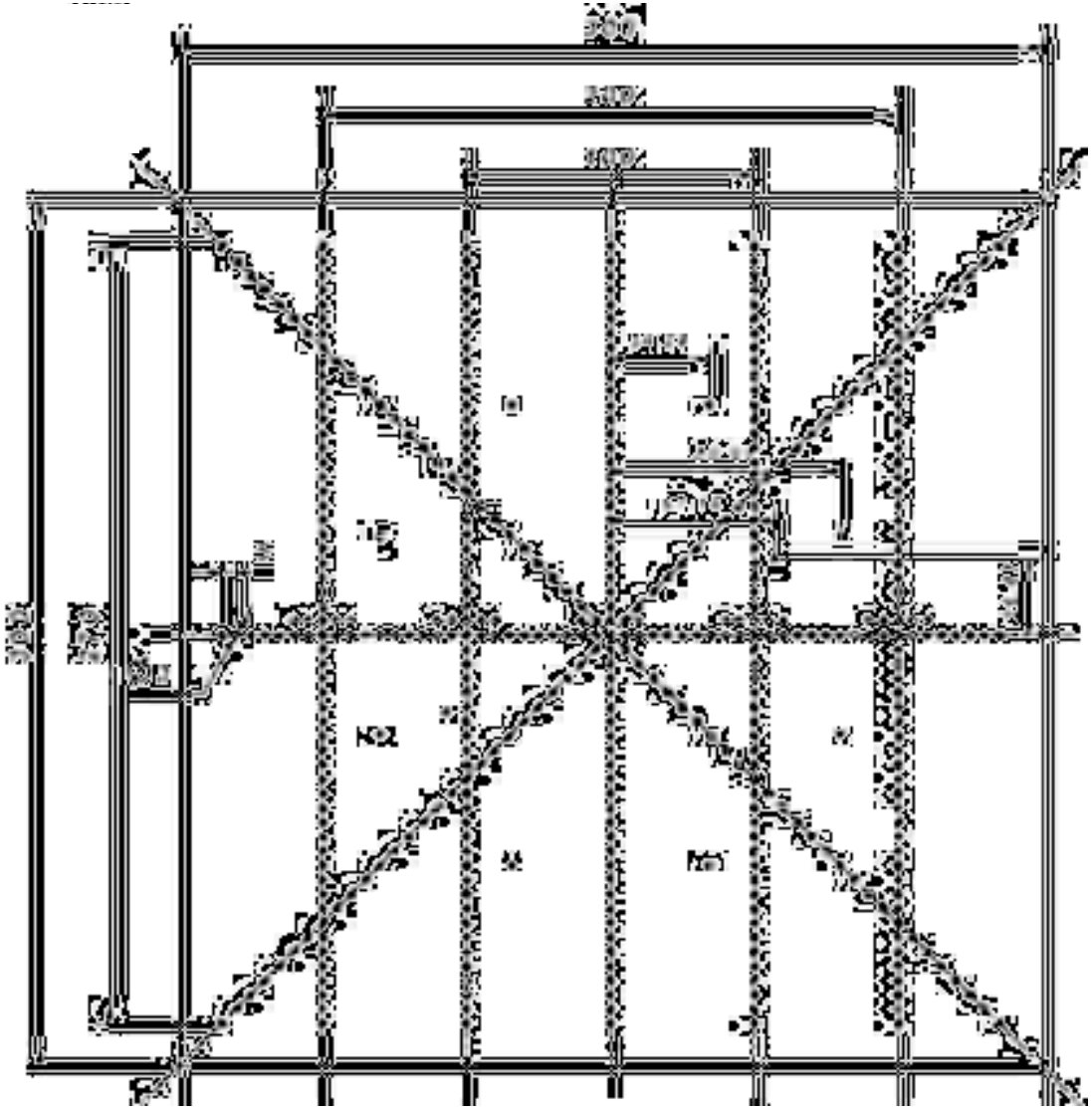
Sensor



- Based on Pixel Ionization Technology as MXX
- Active area: 27cm x 27cm
- 453 detectors
- Ø3mm/5mm height
- 5 mm pitch on the main axis and MLC columns, 7 mm on the diagonals

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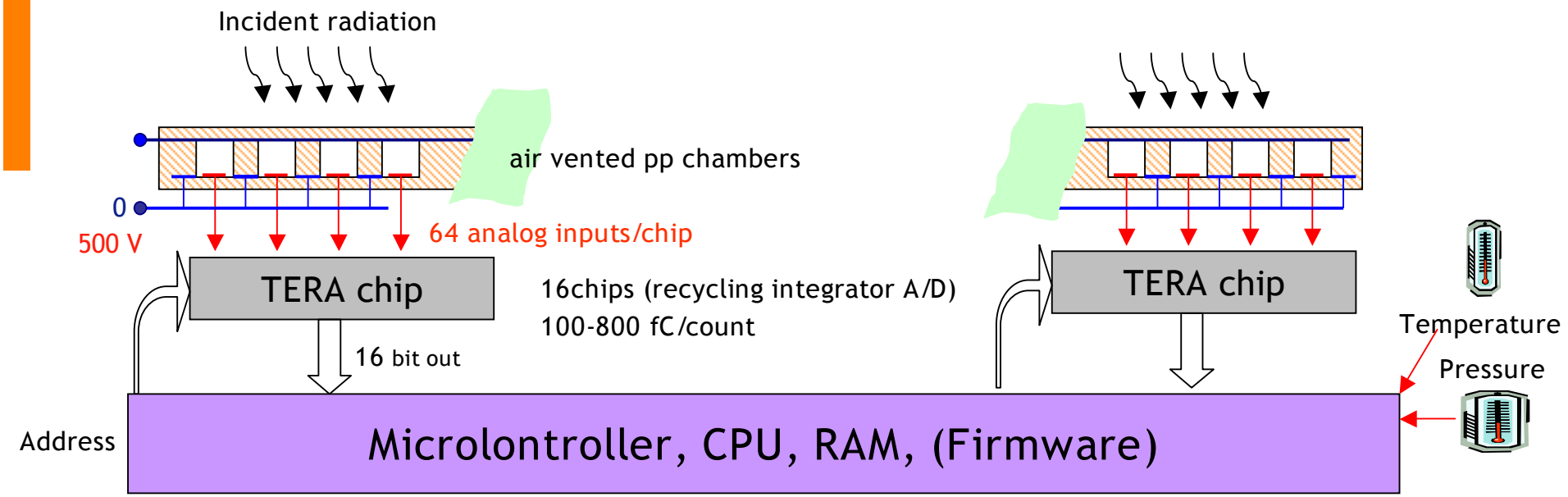
Electronics



Ethernet connection

PC – main SW application

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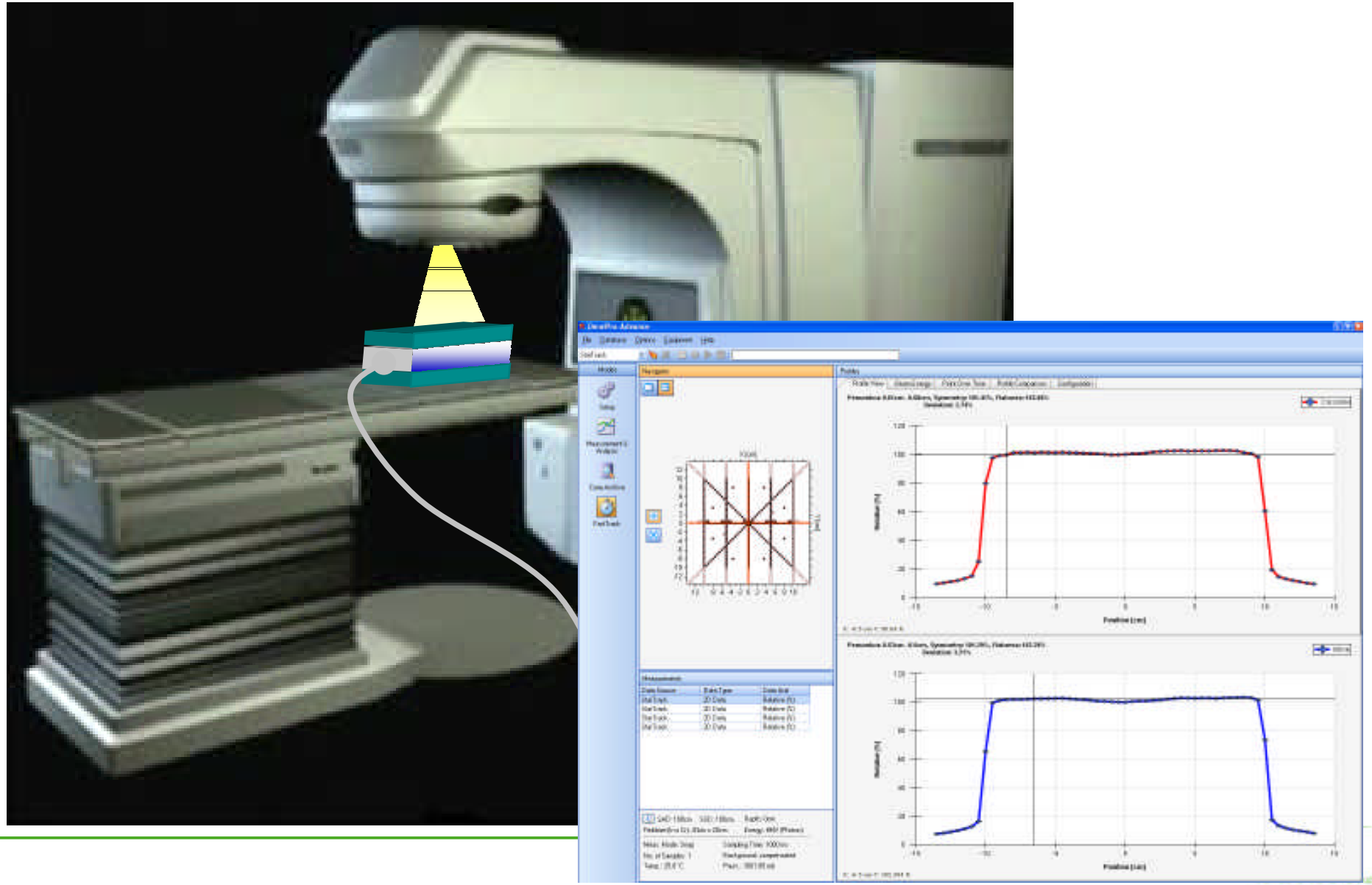
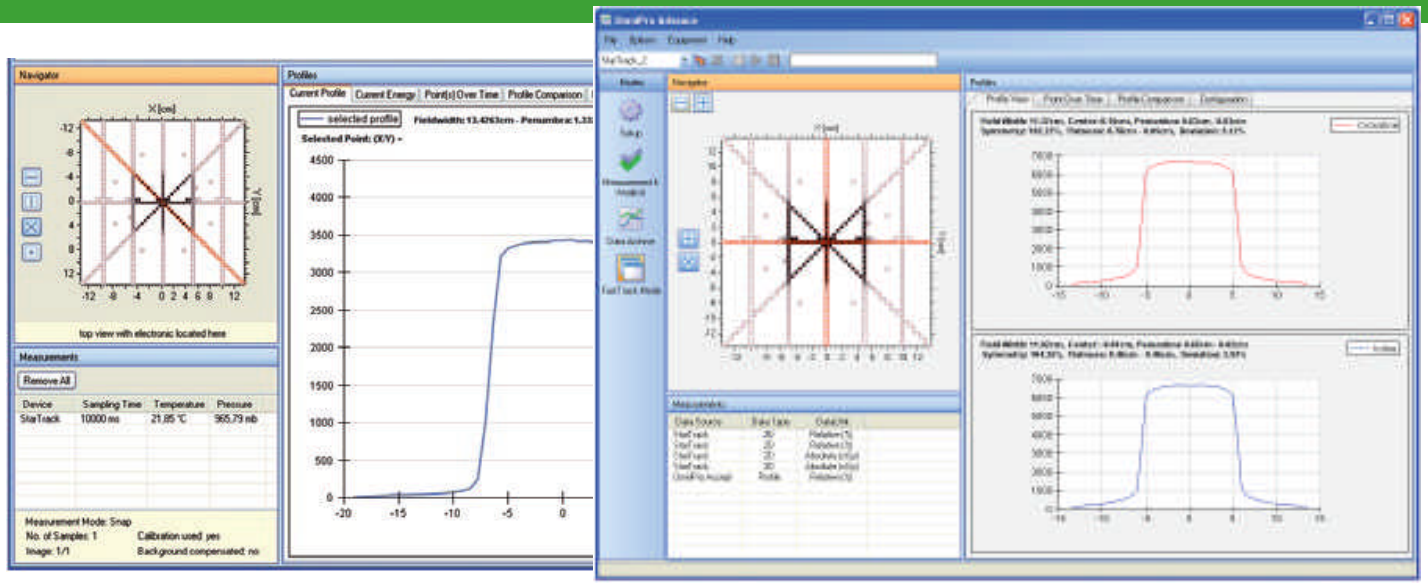
Intended use

- **Daily machine QA:**
  - Field size
  - Penumbra
  - Flatness
  - Symmetry
  - Dose output
  - Light field vs. radiation field
  - Beam energy (constancy test)
  - ☺ All at once!!!
- **Wedge QA:**
  - Wedge factor
- **MLC QA:**
  - Relative position of leaves at 0, ±5 cm, ± 10 cm

StarTrack Set-Up



OmniPro-Advance SW



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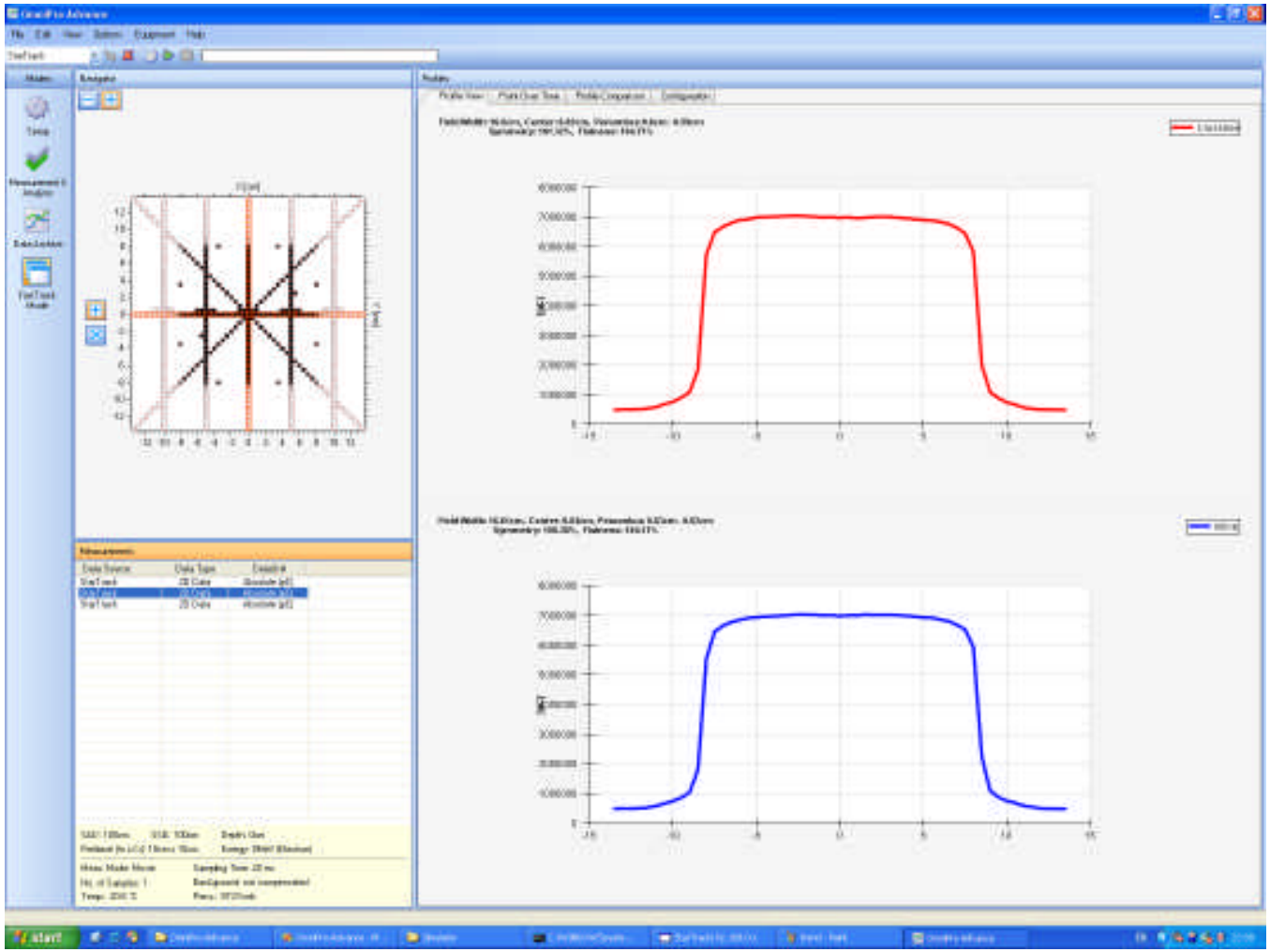
Fast Track measurement mode



Real time measurement and analysis of symmetry, flatness,penumbra

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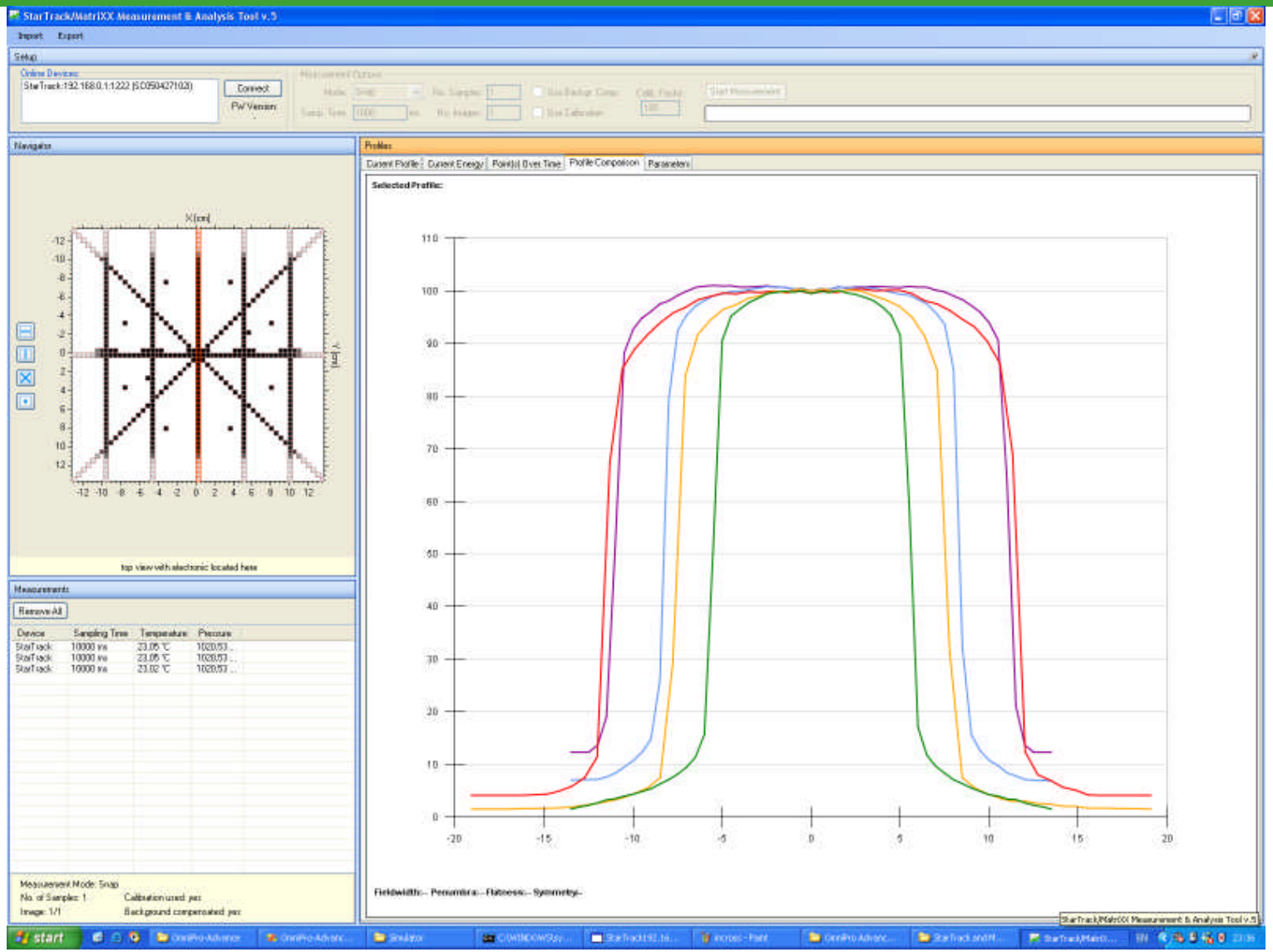
Beam Profile



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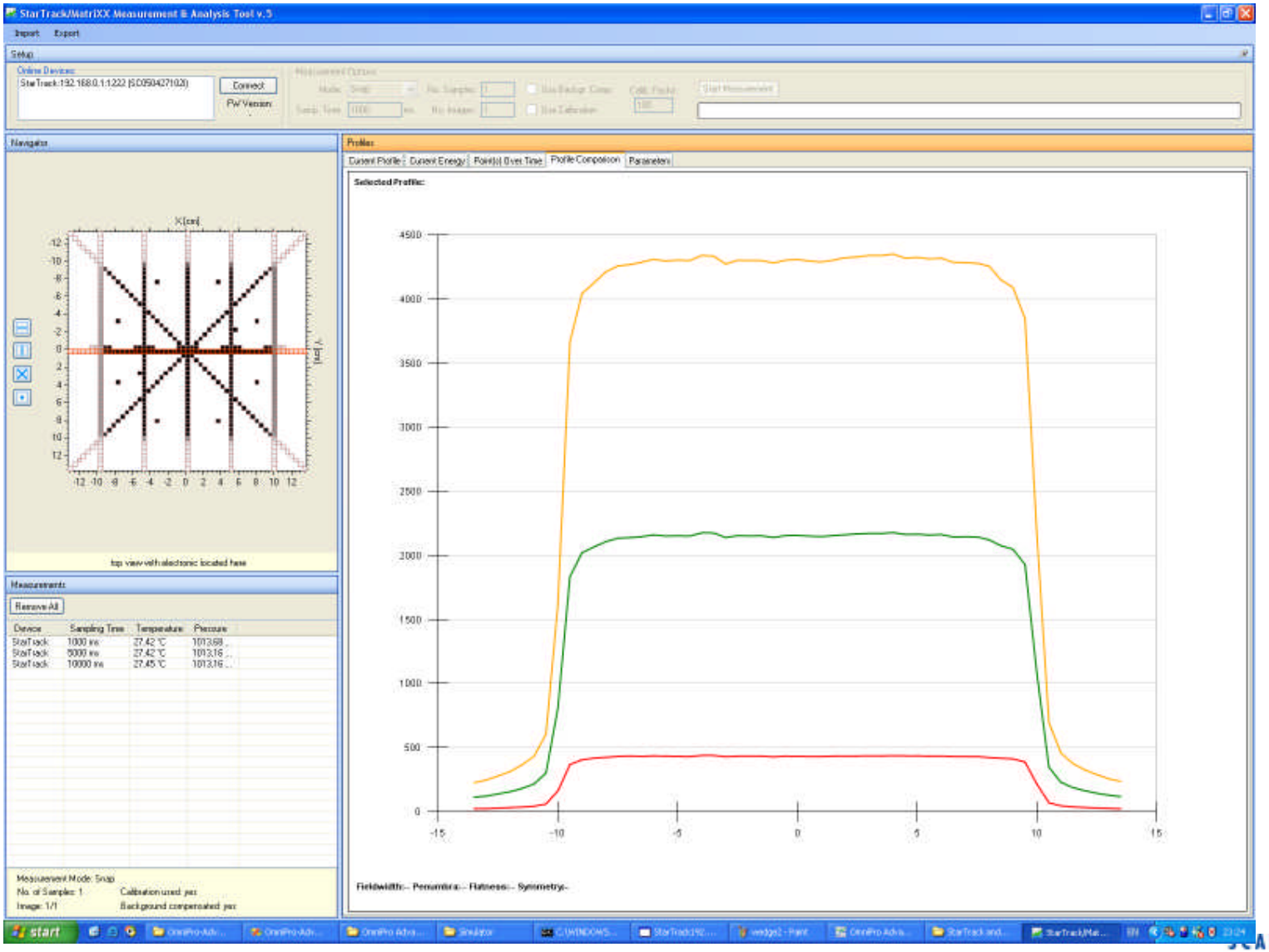
Beam Profile



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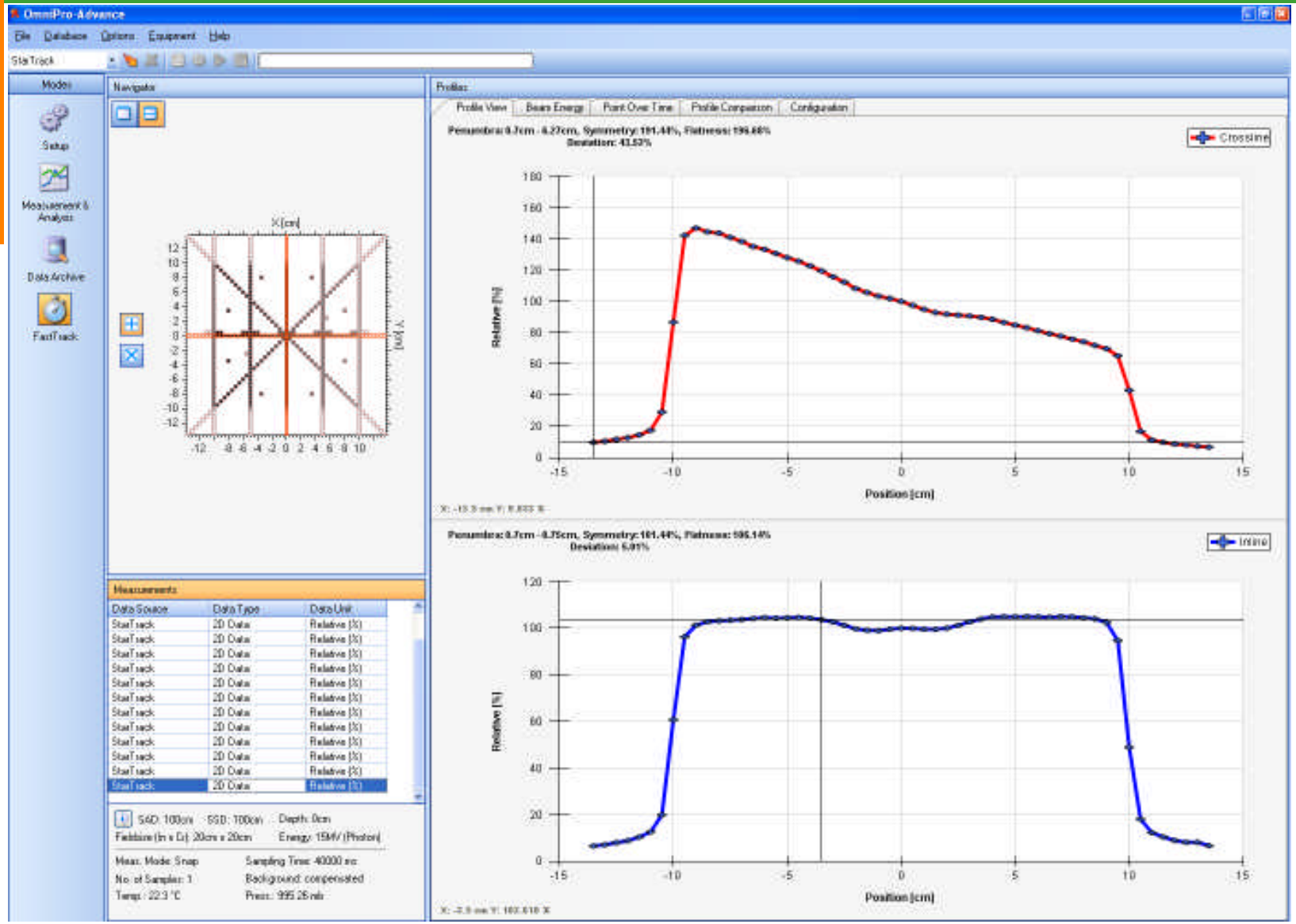
Dynamic-Wedge Check



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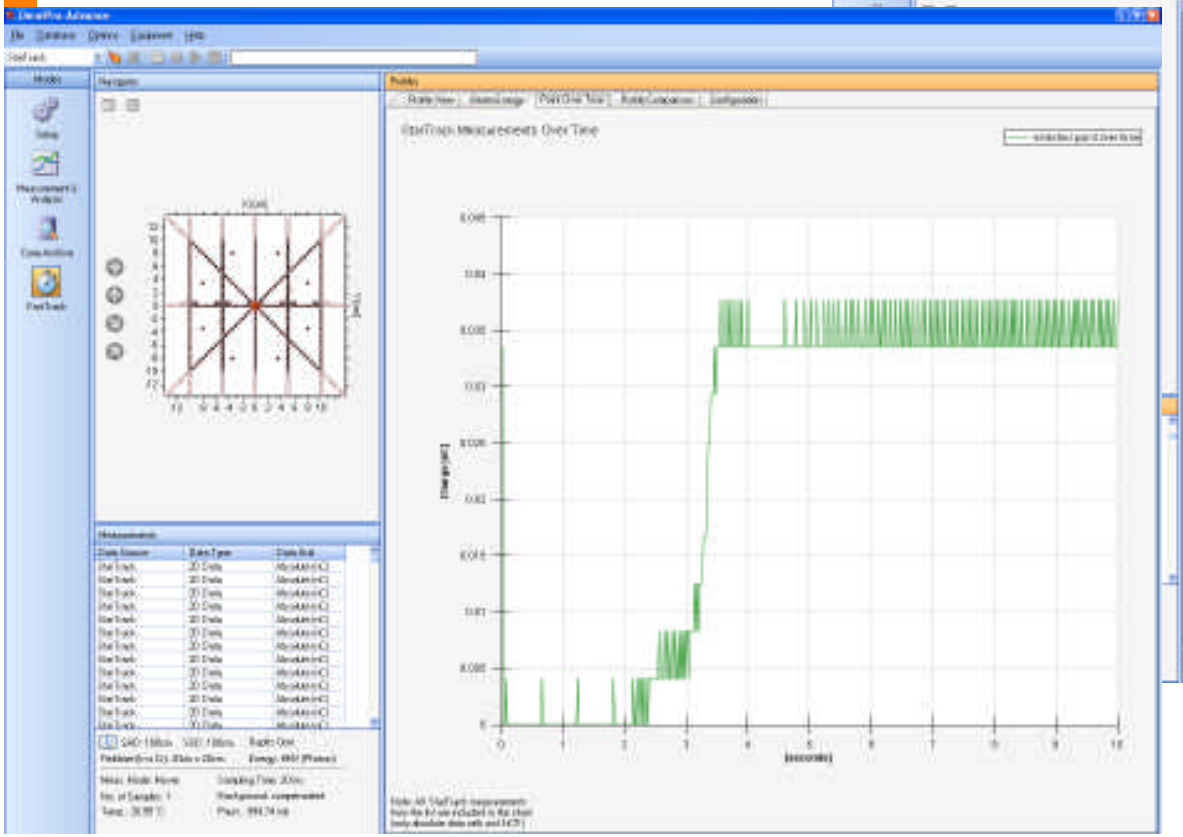
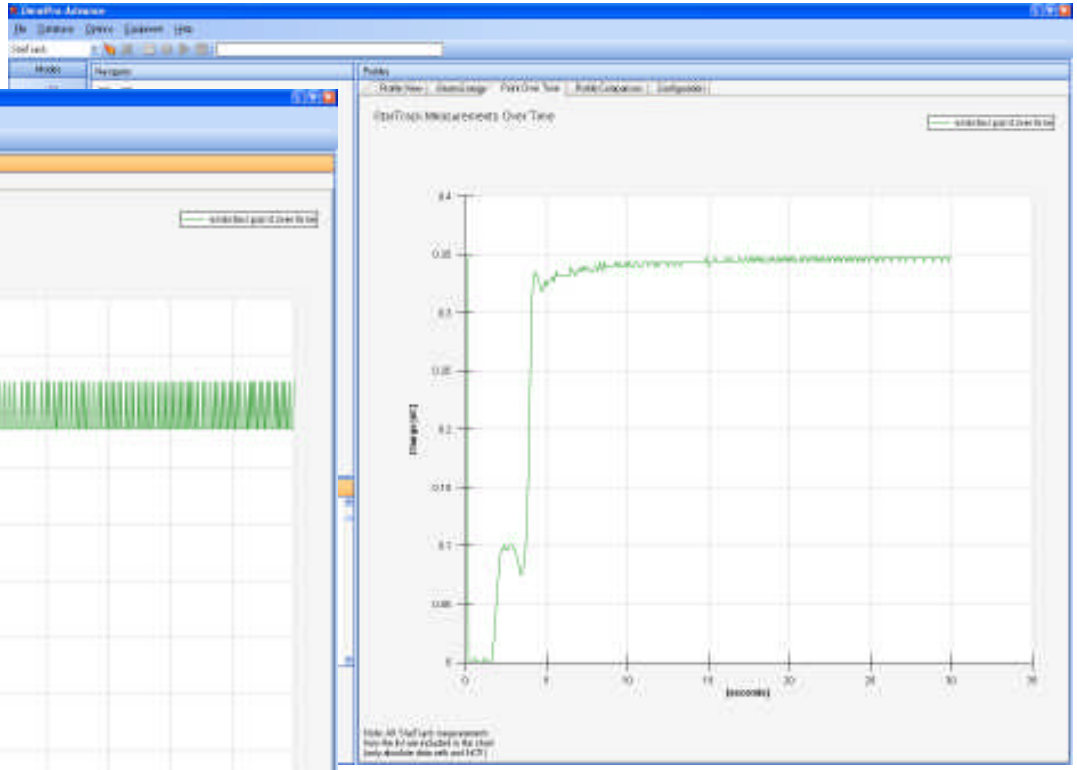
LINAC-Start-Up Check (point-over-time)



Sampling time 20 msec



Sampling time 100 msec

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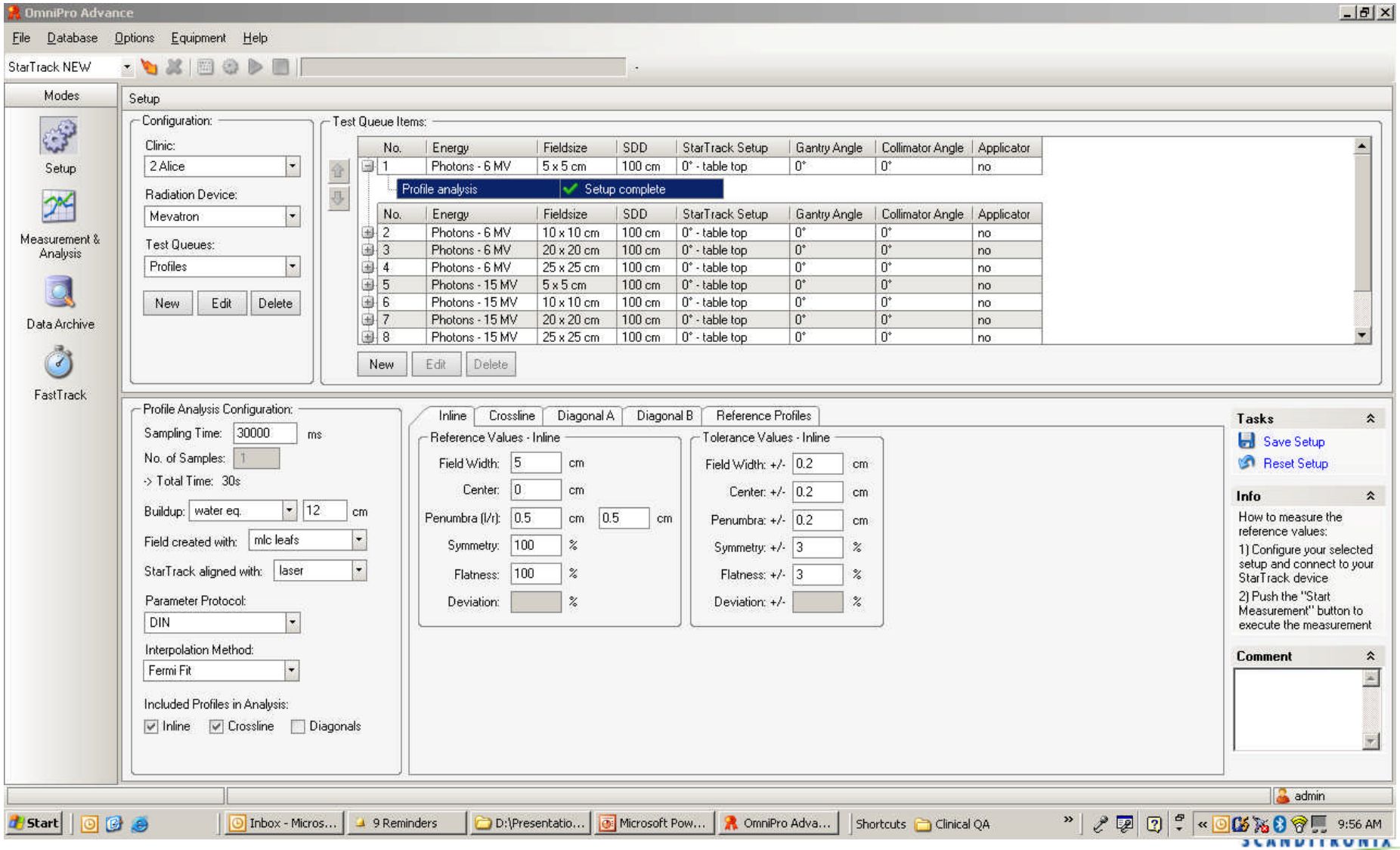
OmniProAdvance: perform reference measurement



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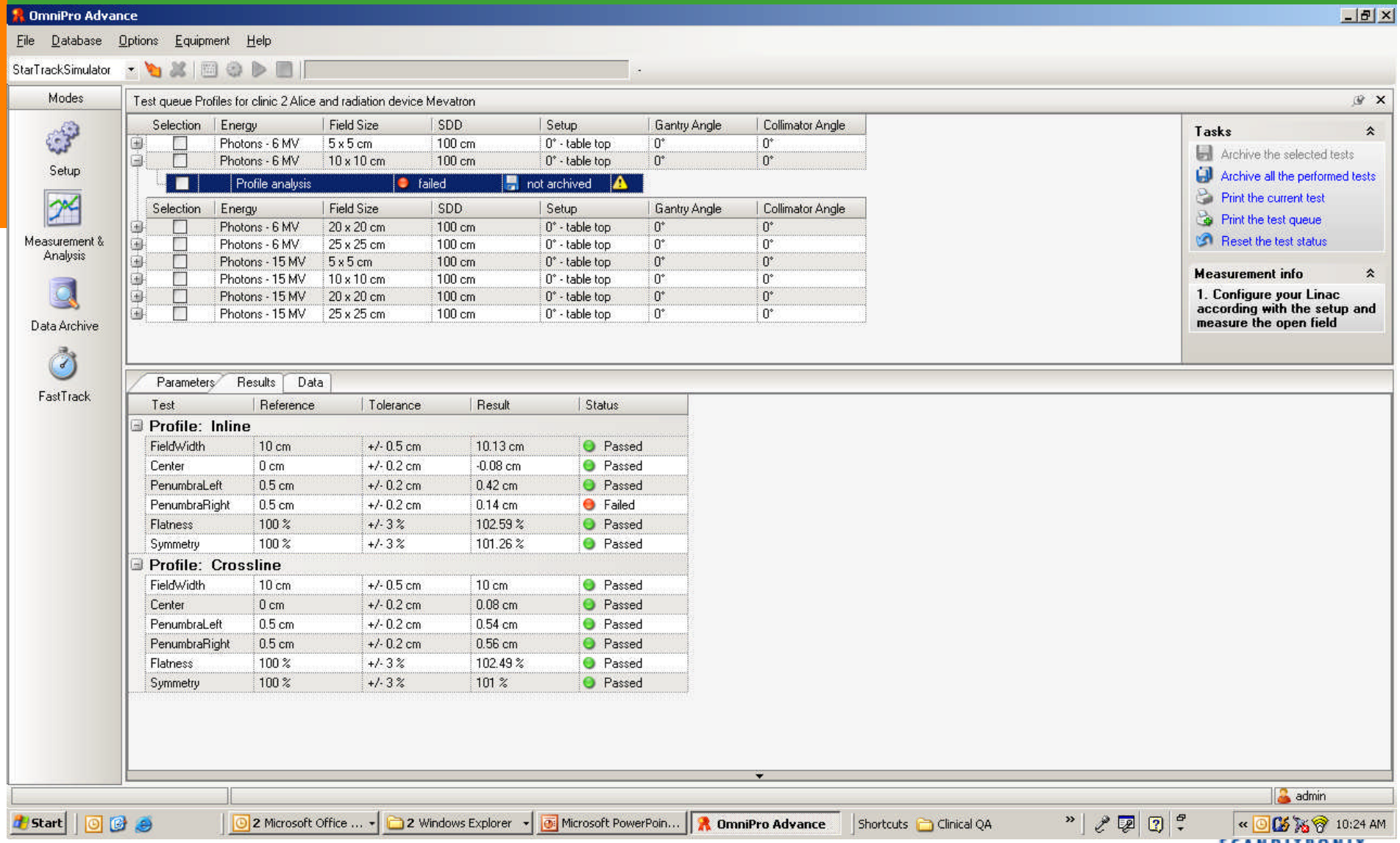
OmniPro-Advance: perform daily QA



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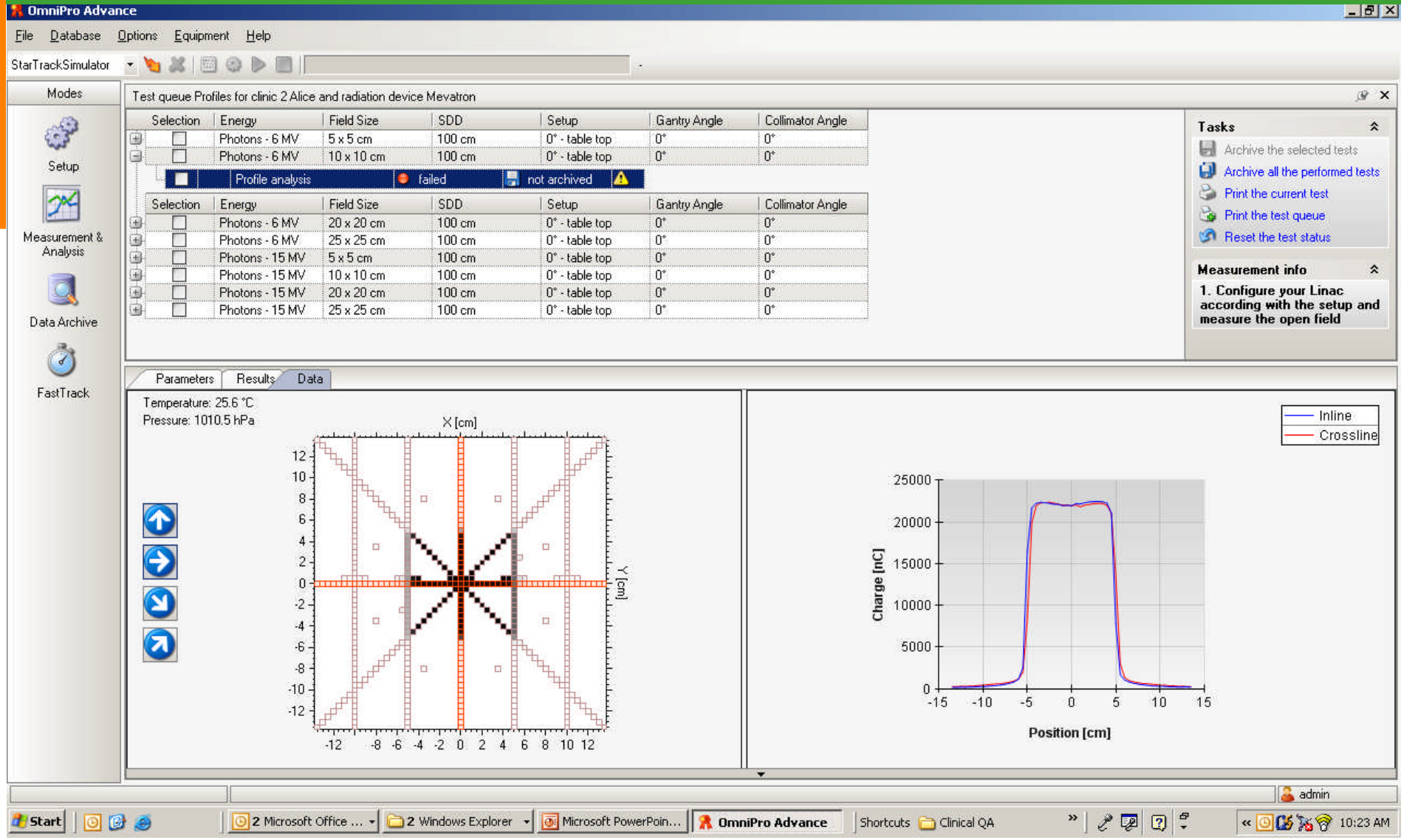
OmniProAdvance: perform daily QA



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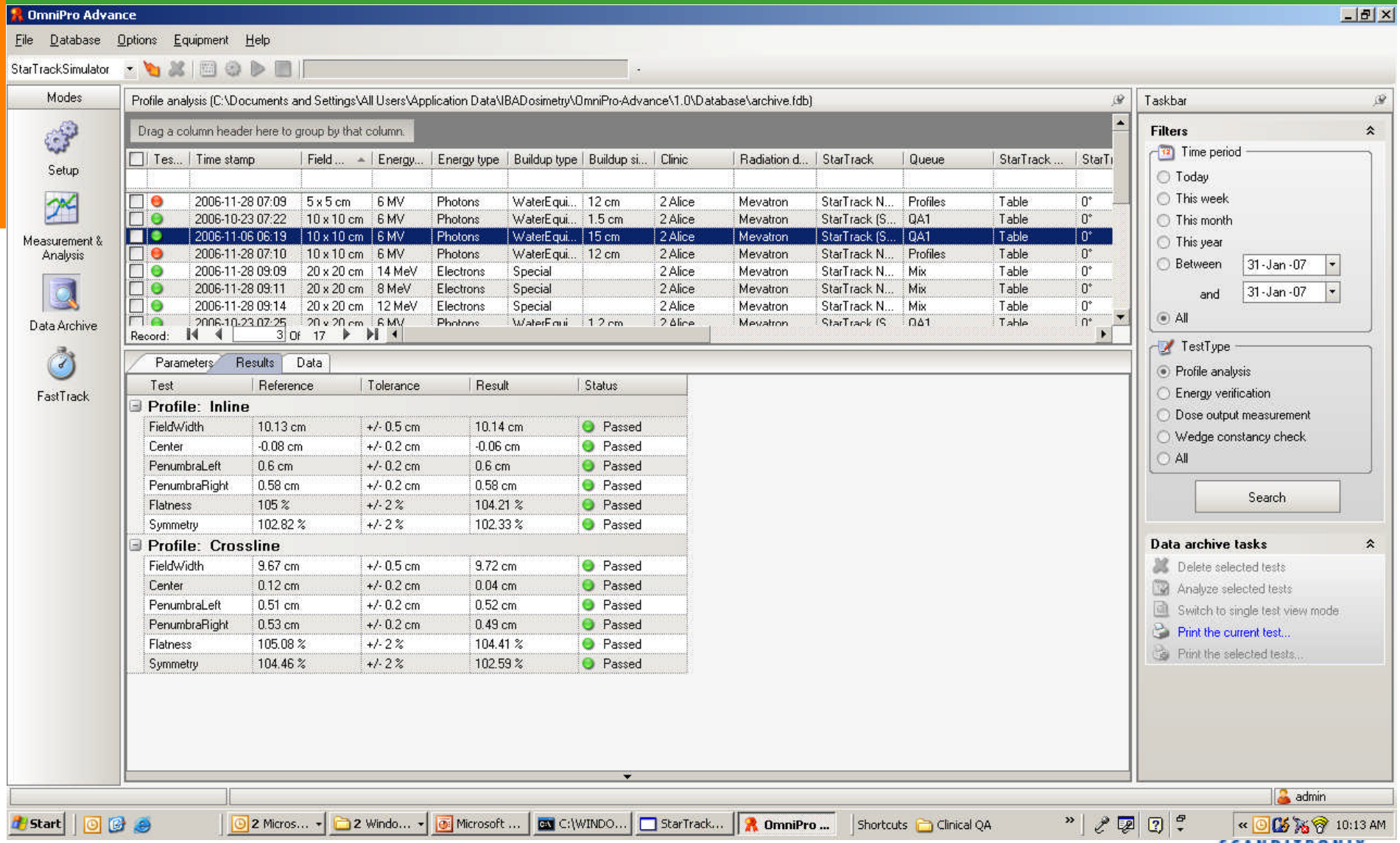
OmniProAdvance: data archive



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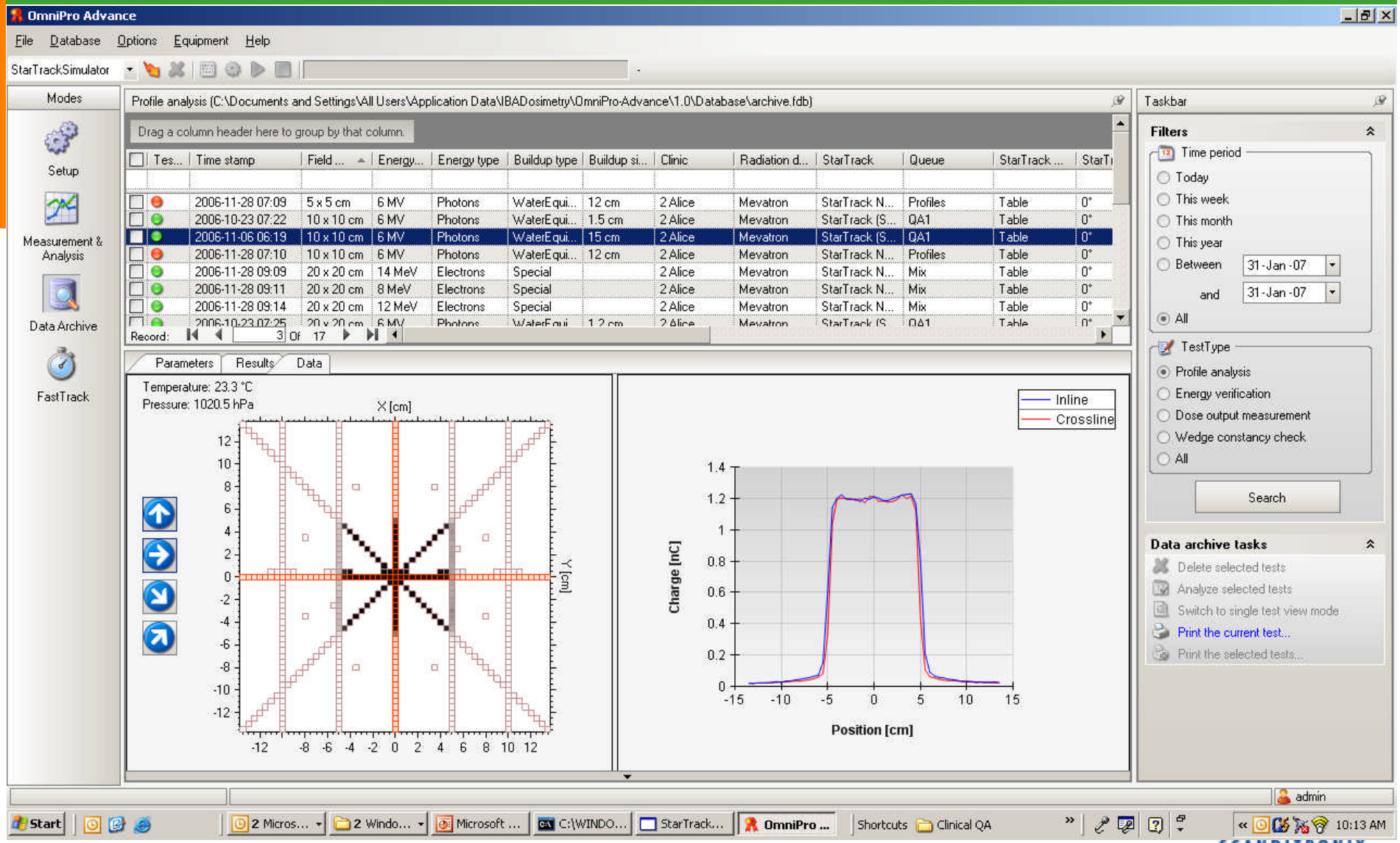
OmniProAdvance: data archive, profile analysis



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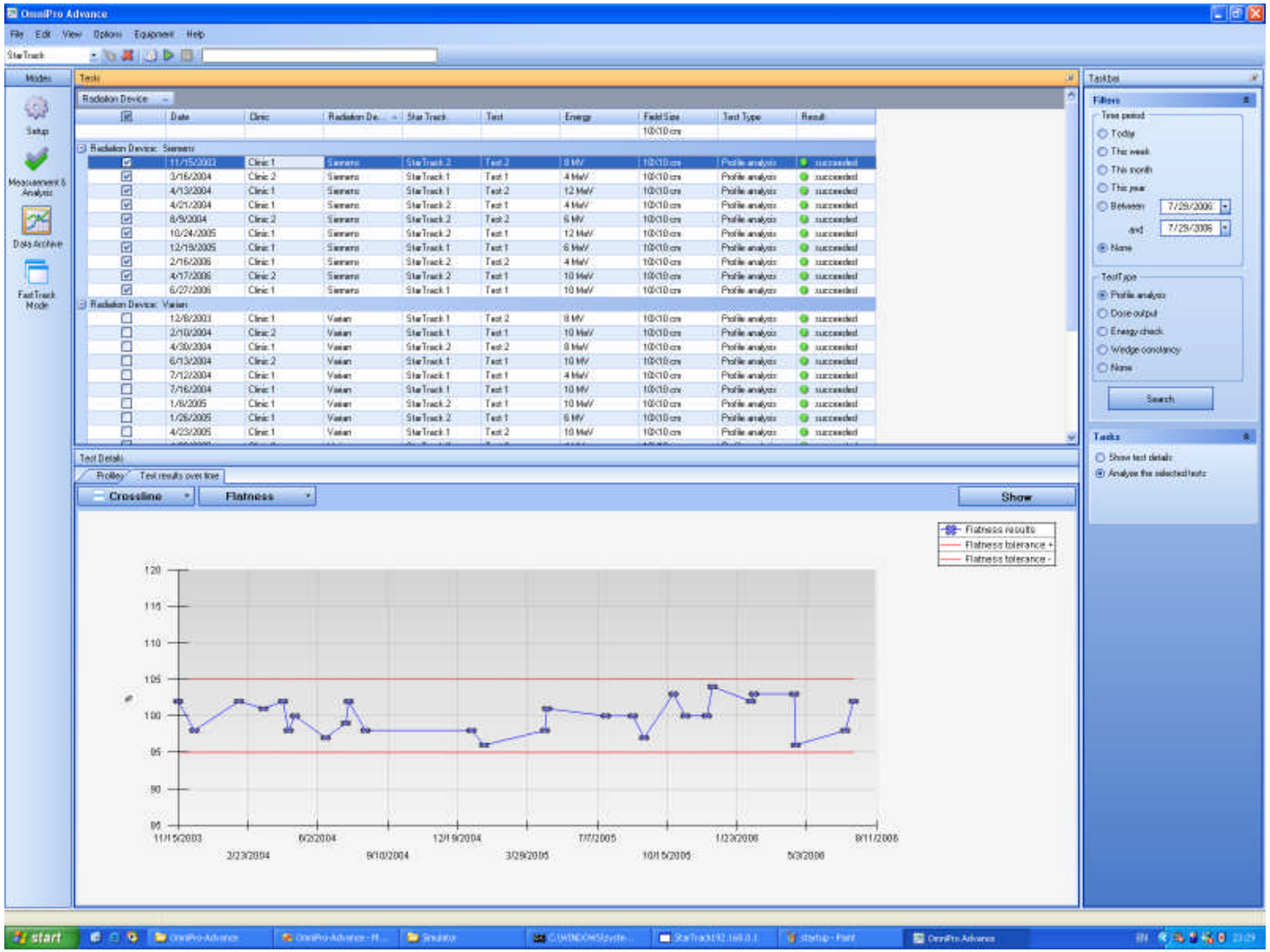
Trend analysis



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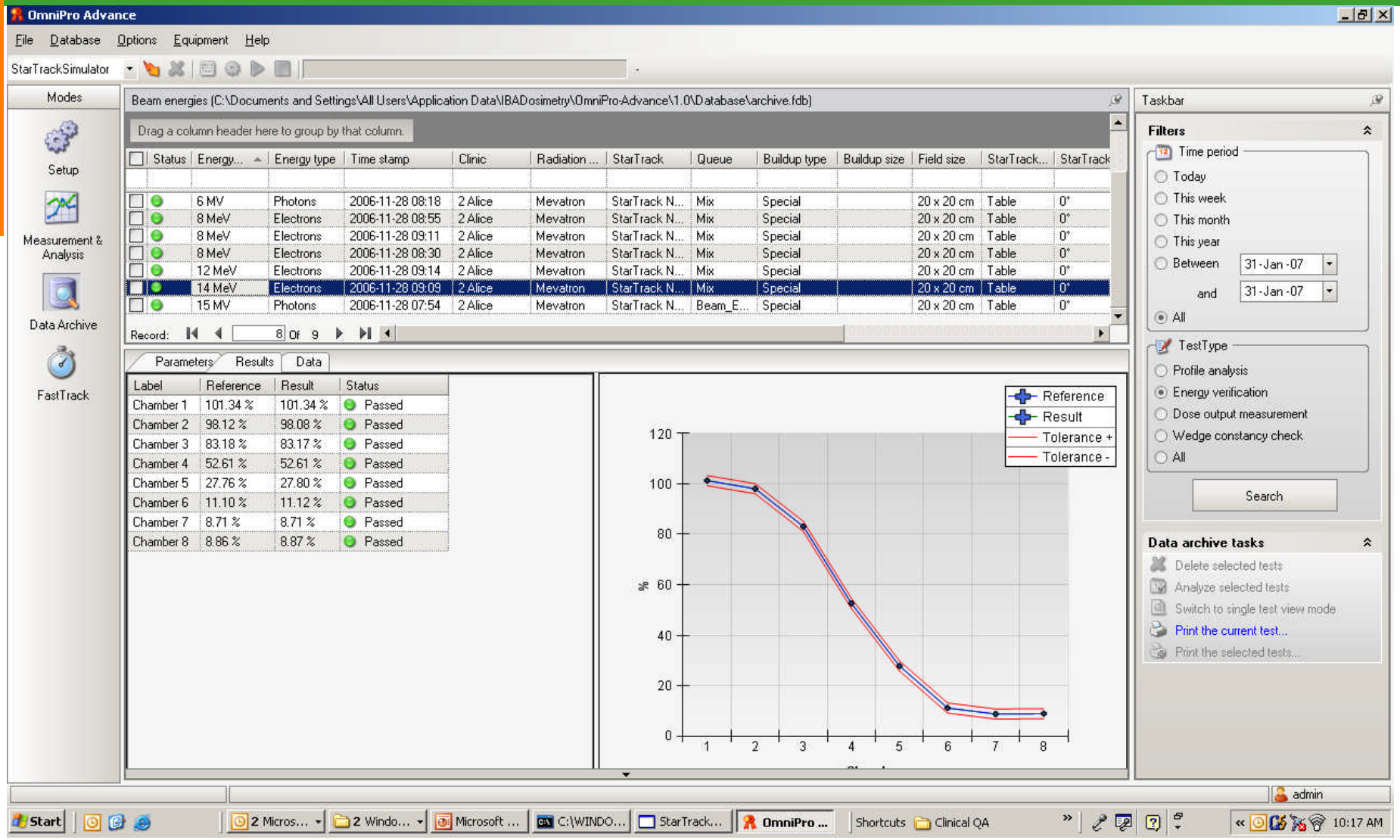
OmniProAdvance: data archive, beam quality analysis



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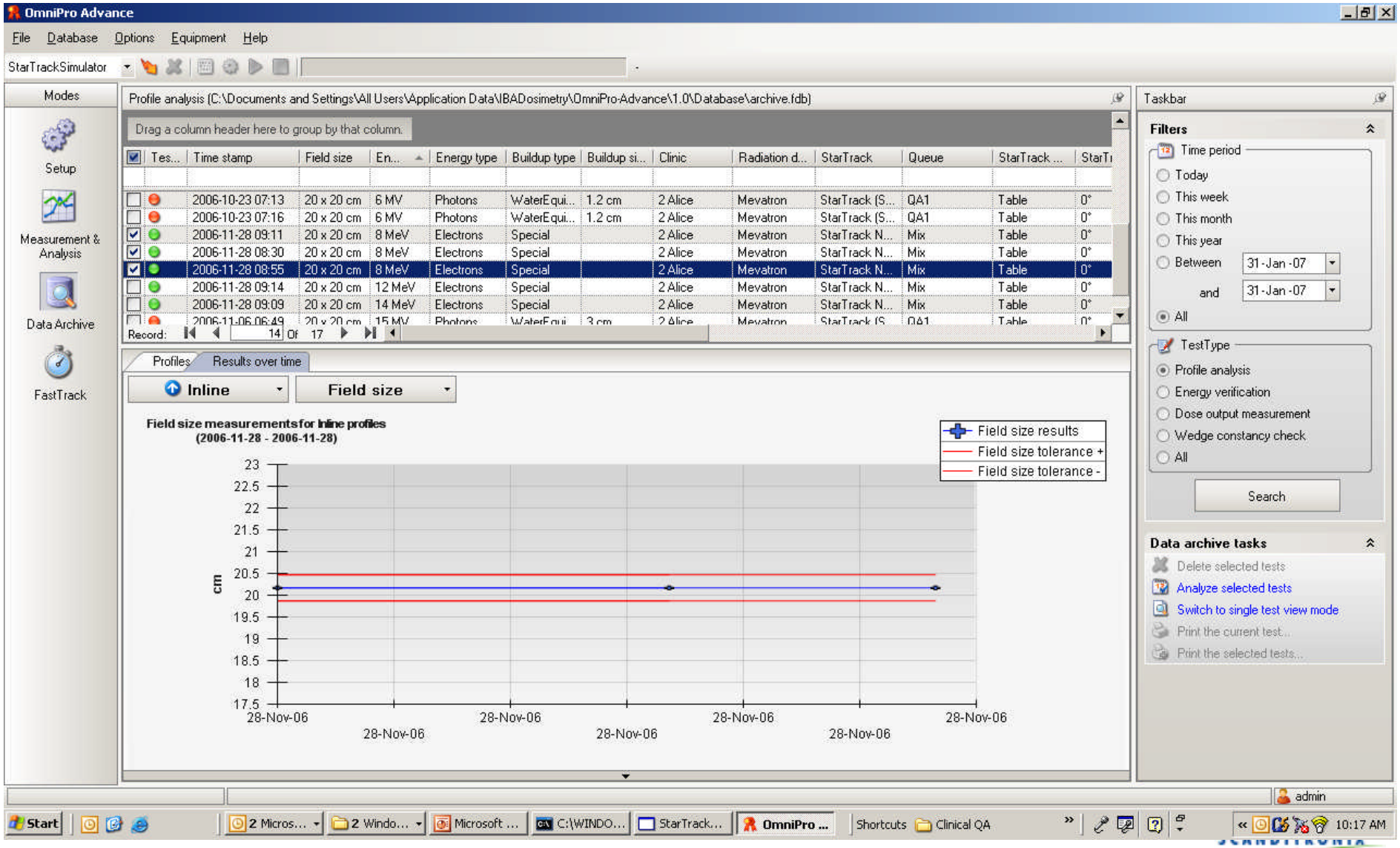
OmniProAdvance: data archive, trend analysis



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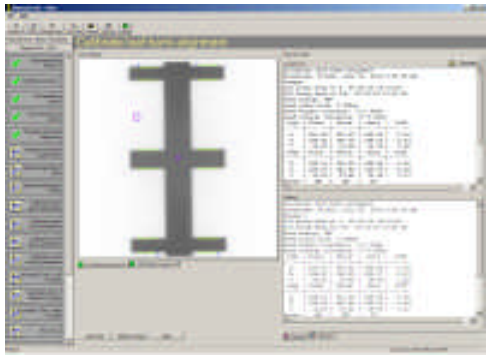
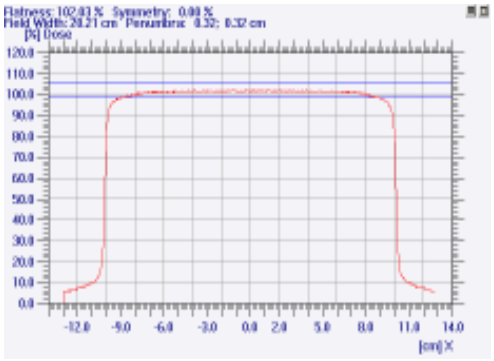
Digital IMRT QA concept

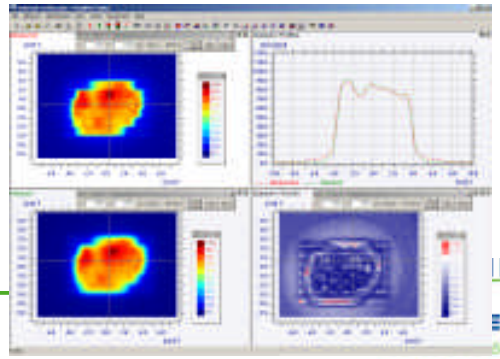
MLC calibration
with ManualCal



QA
with OmniPro-Advance

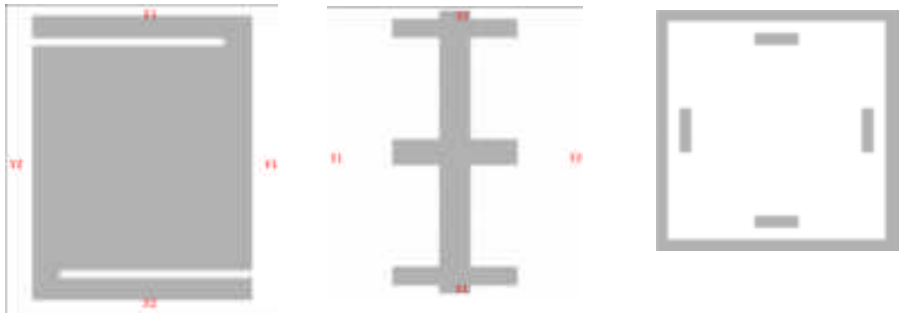


Plan verification
OmniPro-I'mRT



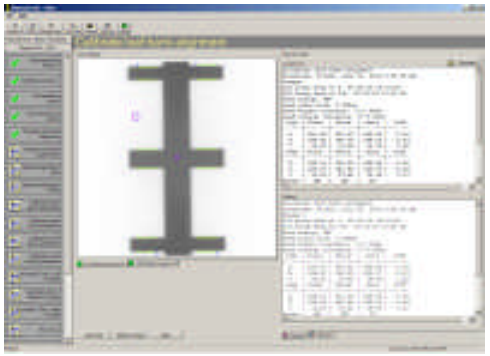
Digital IMRT QA concept: Basic Principle

Use of the EPID to acquire images



Take images using field shapes dedicated to certain calibration tasks

Load the images into the Auto-CAL-SW



Analyze the images and compute calibration factors

Set these calibration factors in the LINAC-SW which controls the head.

Rerun the test again until the tolerances are met

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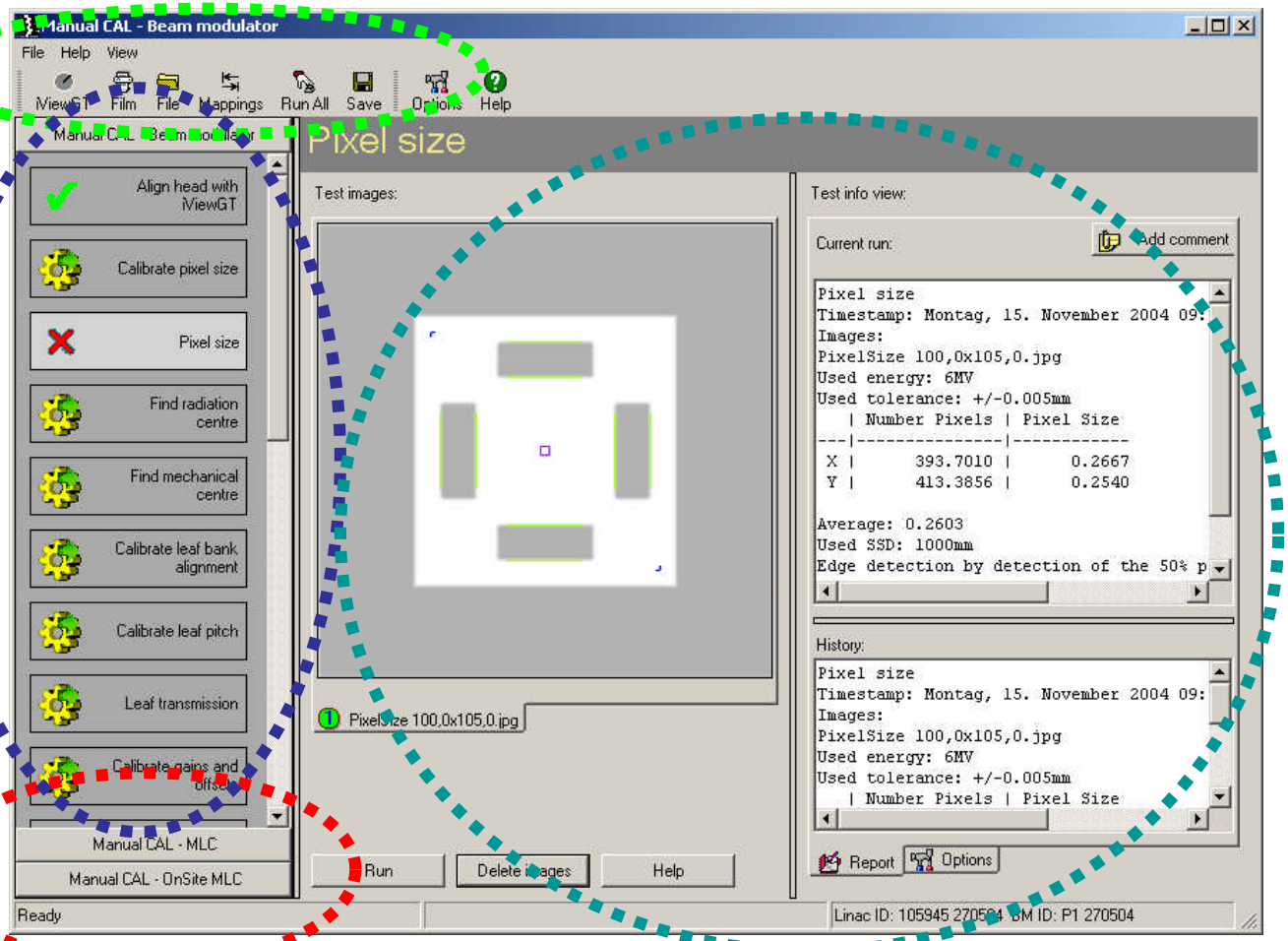
AutoCAL user Interface

Common tasks for all tests



Workflow

Current Test

Other applications

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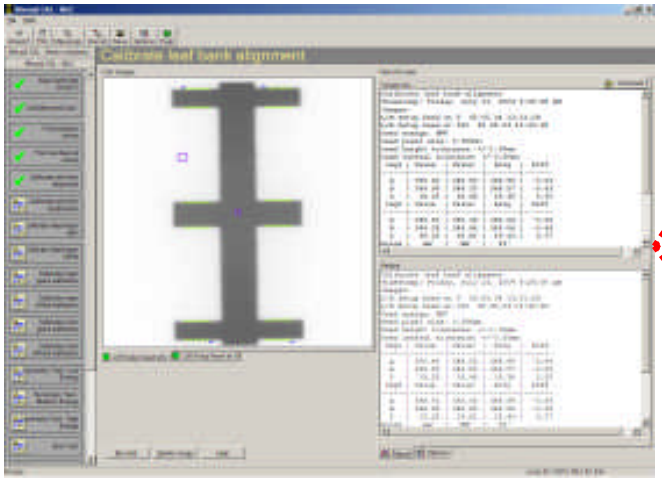
Functions



Set up panel (EPID):
Head Alignment, pixel size, mechanical and radiation centre

Calibration:
Leaf bank Setup (lateral and height)
Leaf transmission
Major/Minor gains and offsets (positions)

Acceptance:
Field size, Symmetry, Light field, Penumbra, Striped image

Archive:
Used images and results

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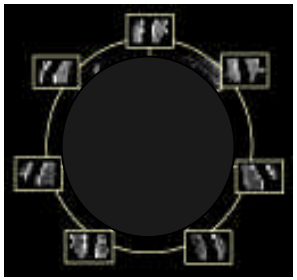
Configuration

Functionality	Product configuration
1. MLC calibration	- AutoCal / license
2. Machine QA and patient plan verification	- OmniPro-I'mRT - License additional workstation - I/f to EPID - DICOM import / workstation Total average system
3. Optional: Film IMRT	- OmniPro-I'mRT - Body Phantom Total film dosimetry option

Fluence in 1600 pixels 2 D

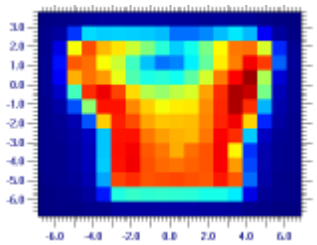
Fluence Determination

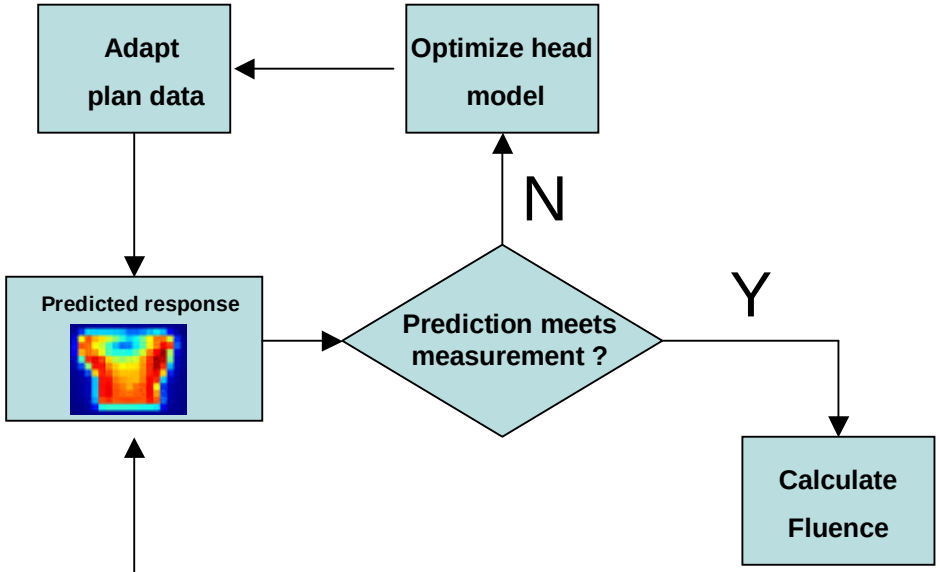
Plan data

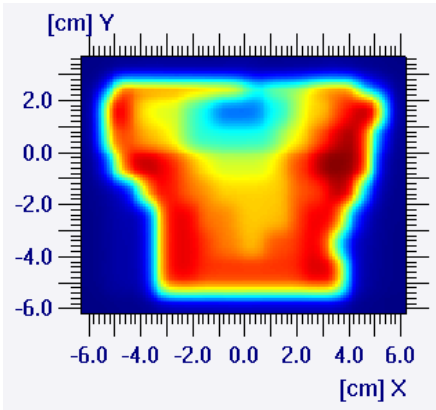


Head Model

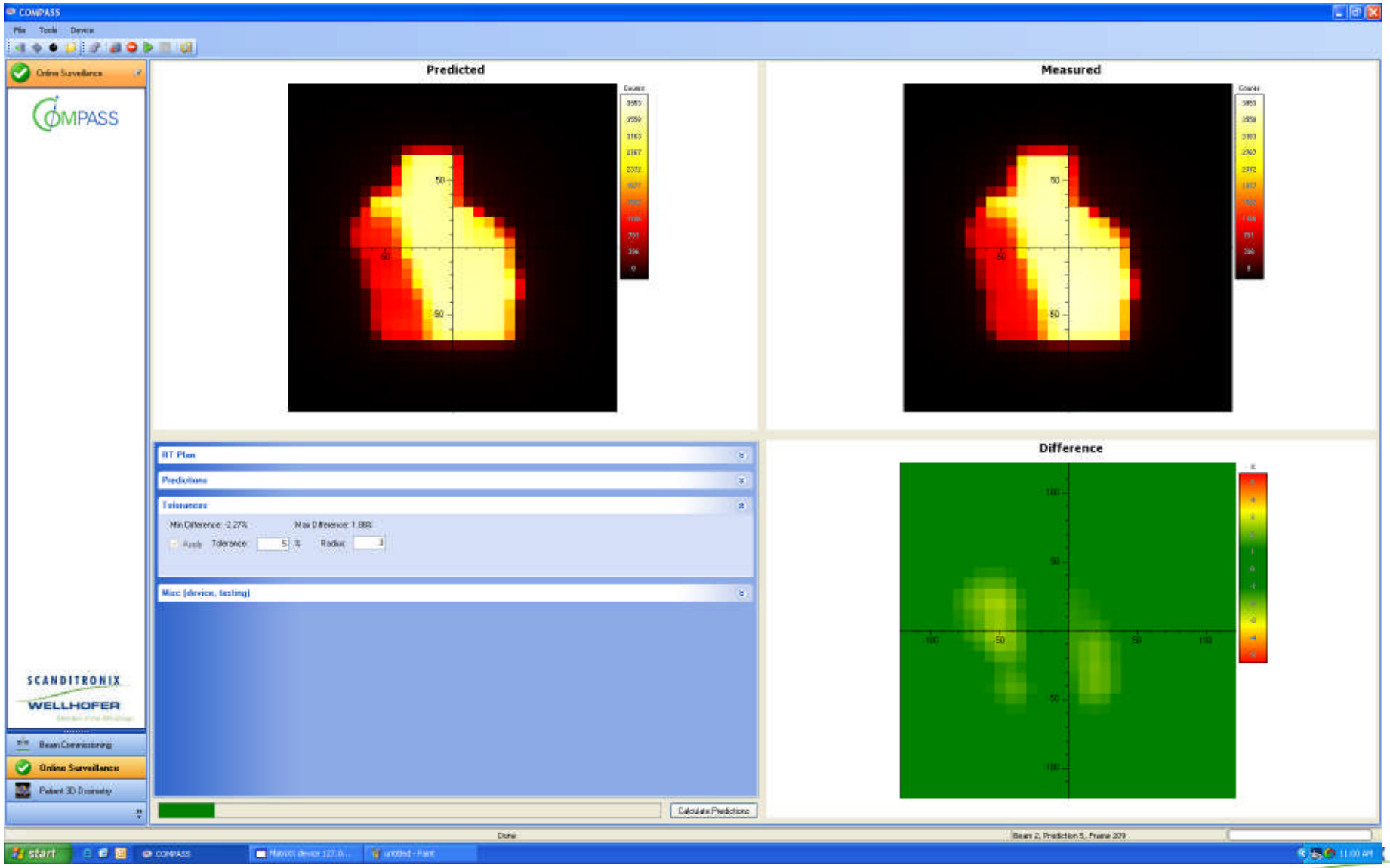
Measured Response







Online Surveillance



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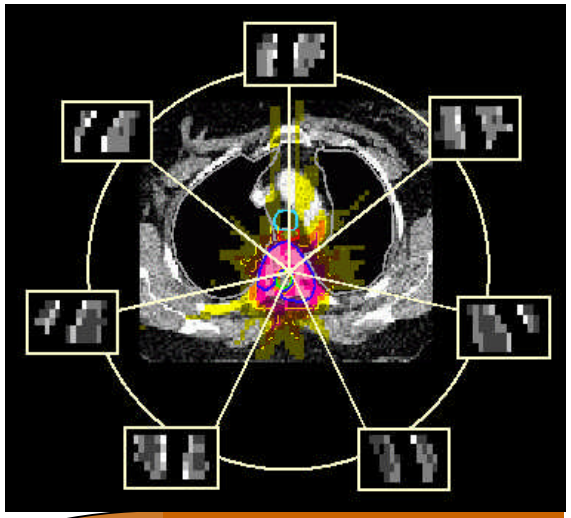
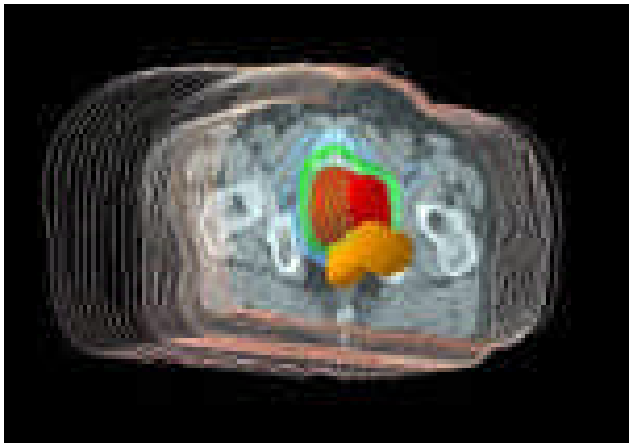
Basic COMPASS Concept



Take incoming fluence

Take Patient anatomy CT



Reconstruct 3D Dose distribution !

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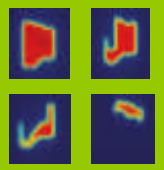
COMPASS Engine

INPUT SOURCES

BEAM OFFLINE

MatriXX

Logged Seq.



BEAM ONLINE

COMPASS

PLAN

DICOM plan

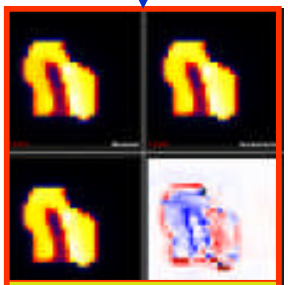
ANATOMY

CT

Integ. Imaging

COMPASS ENGINE

LINAC QA



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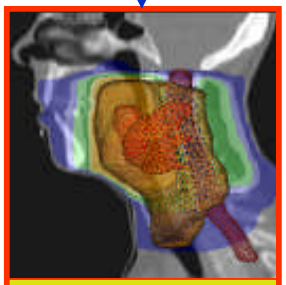
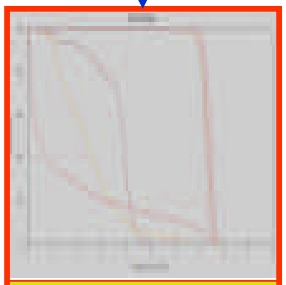
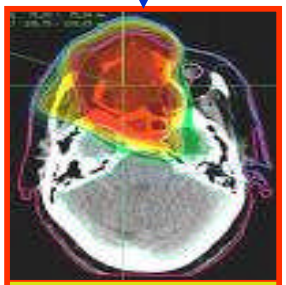


3 D Dosis



Adapted DVH



Adapted Plan


iba