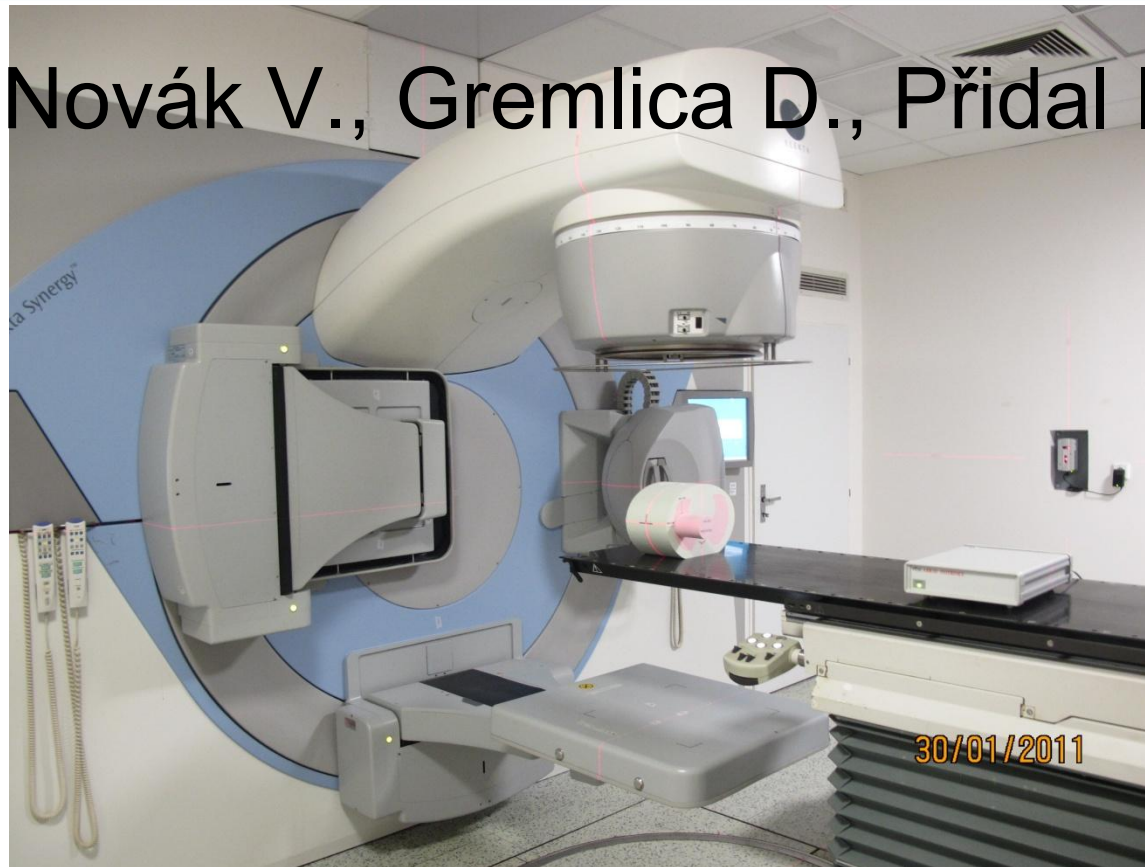
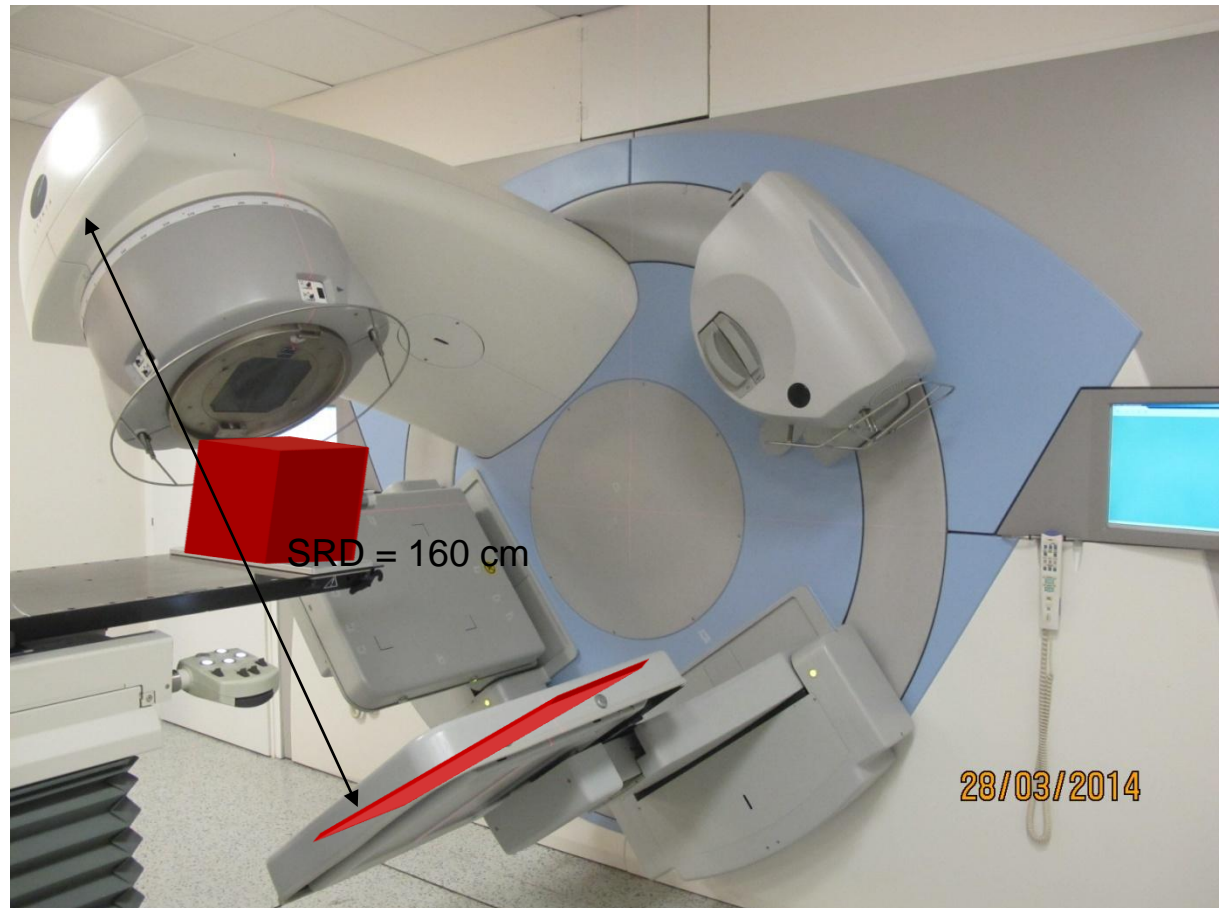


# Ověření možnosti stanovení odezvy EPID pomocí plánovacího systému Monaco

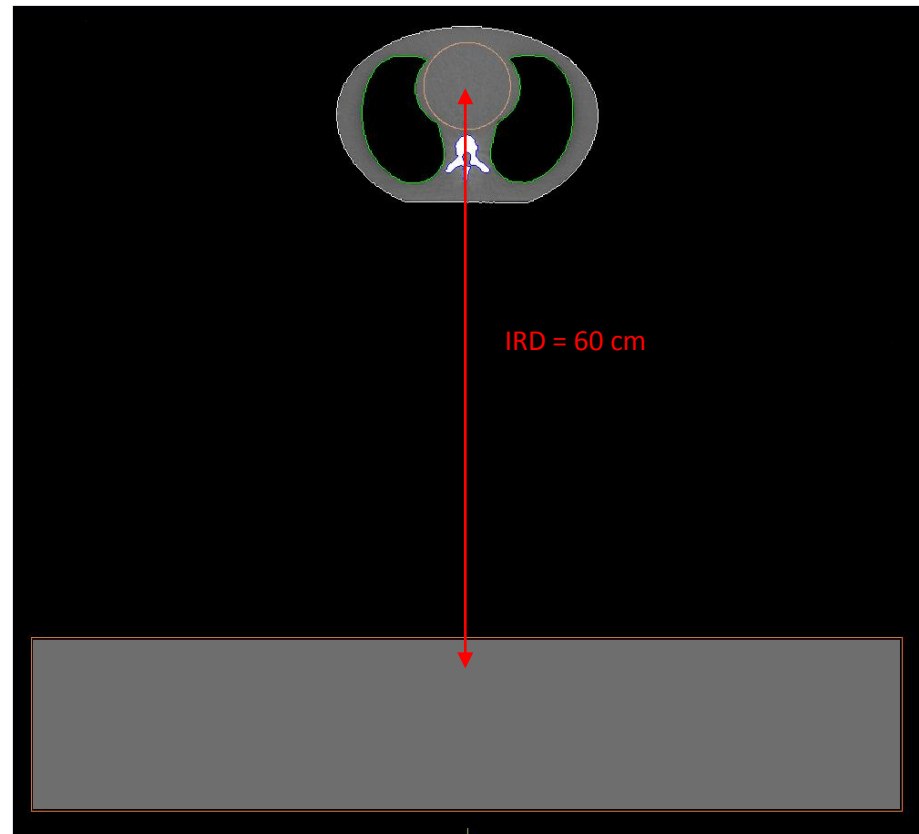
Novák V., Gremlica D., Přidal I.



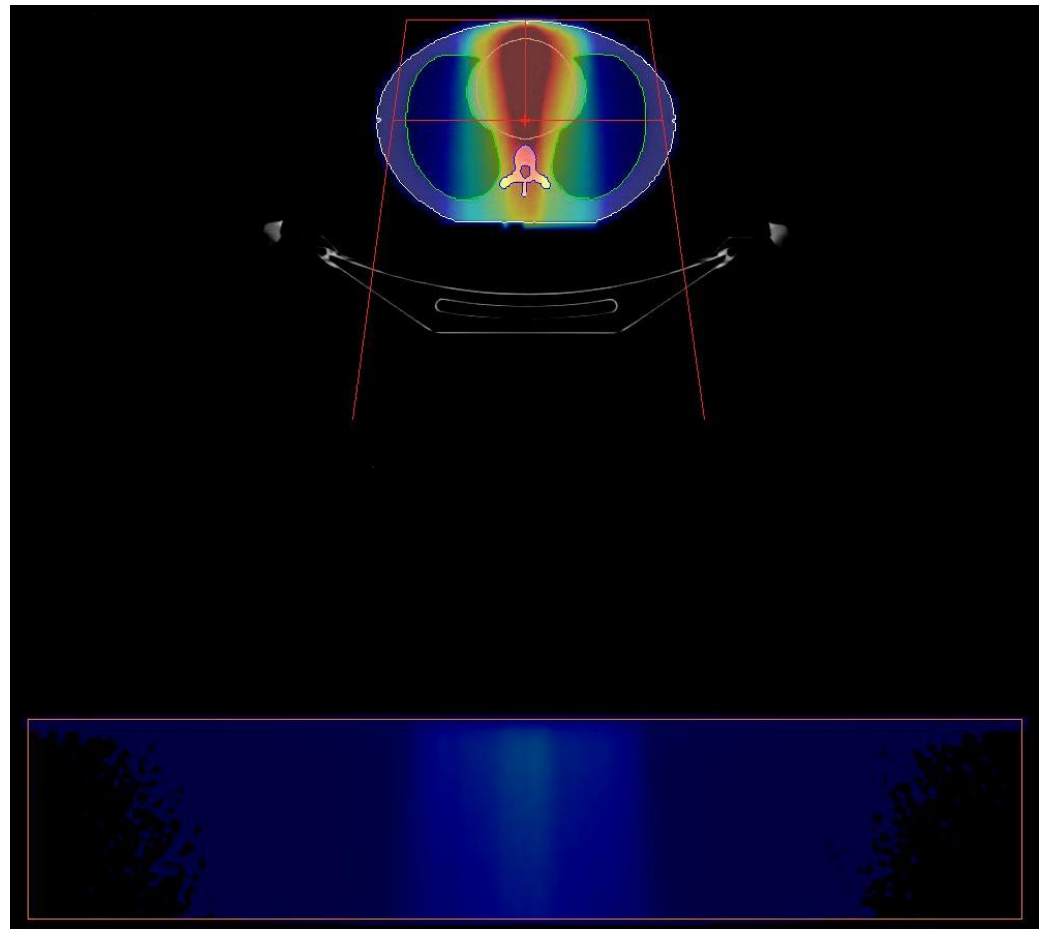
# Posouzení přesnosti výpočtu mimo standardní podmínky



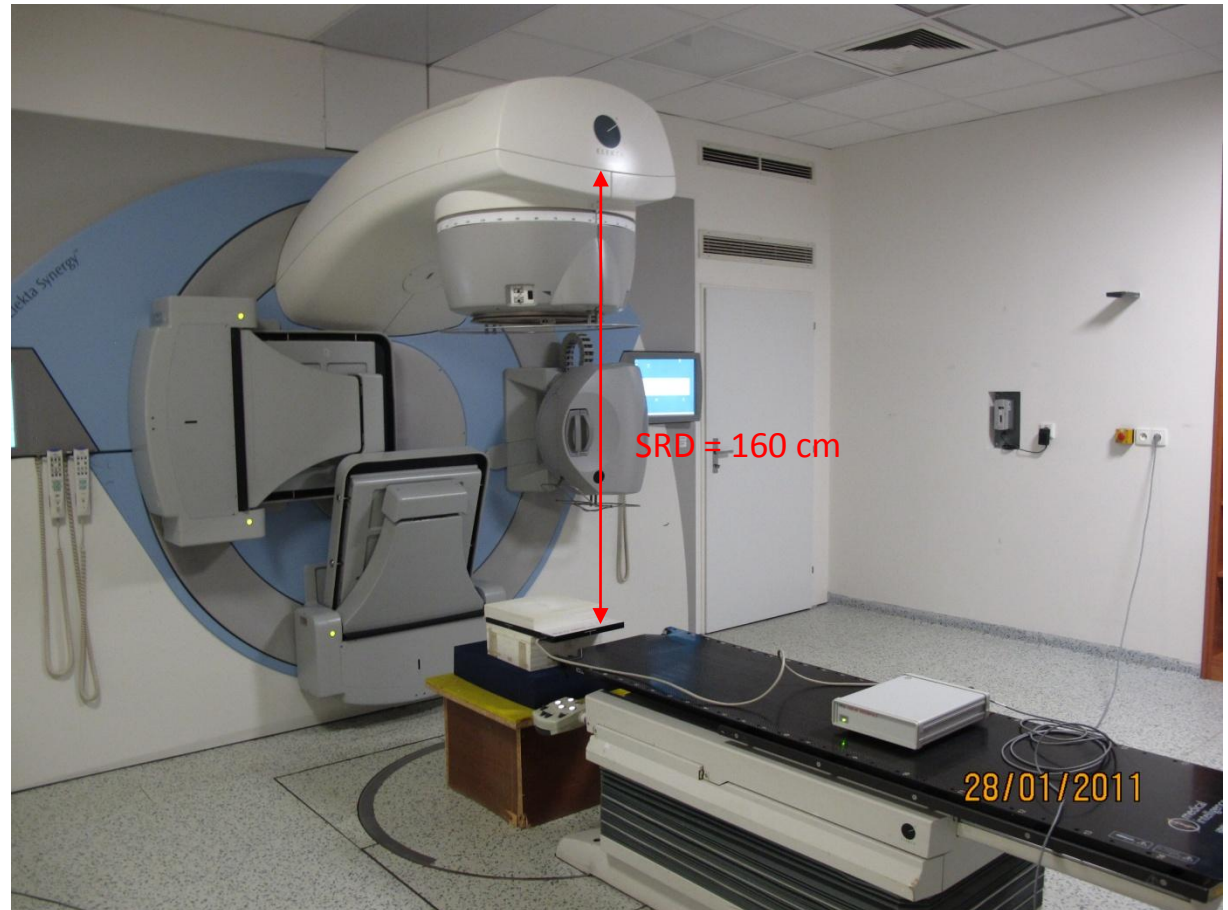
# Zahrnutí struktur iViewGT do výpočetního objemu



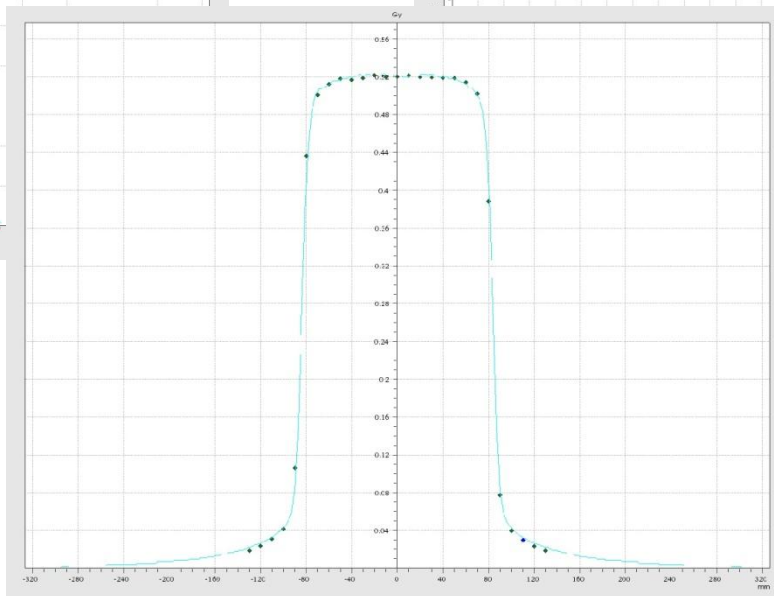
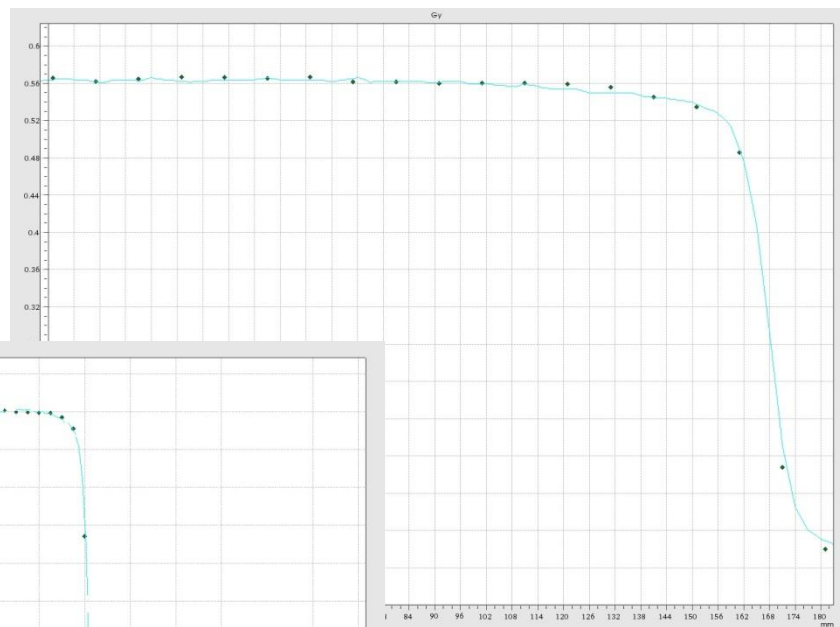
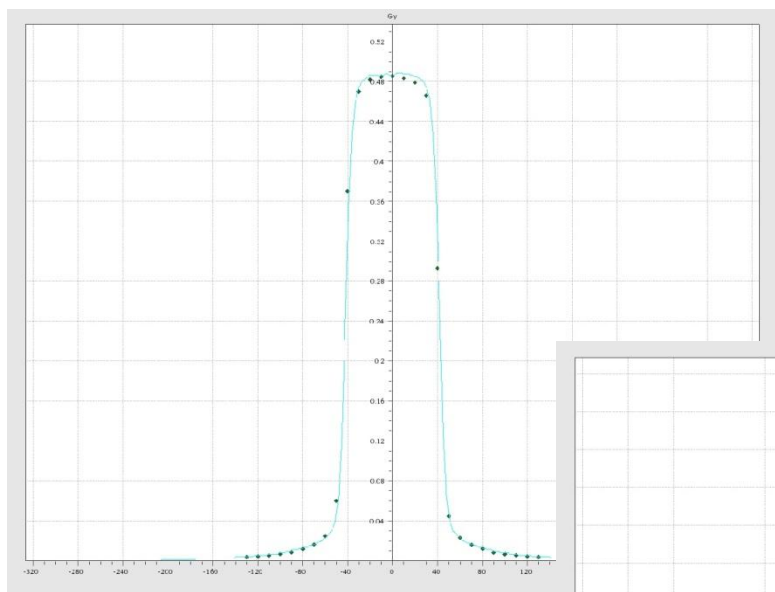
# Rozložení dávky ve složeném výpočetním objemu



# Ověření přesnosti výpočtu dávky ve vzdálenosti SDD = 160 cm pomocí matice detektorů „Seven29“



# Porovnání výpočtu dávky Monaco vs. Seven29 volná čtvercová pole



# Porovnání výpočtu dávky Monaco vs. Seven29

## „volná“ dynamická pole

**Statistics**

Number of Dose Points: 729  
Evaluated Dose Points: 335 (46,0 %)  
Passed: 333 (99,4 %)  
Failed: 2 (0,6 %)  
Result: **99,4 %**

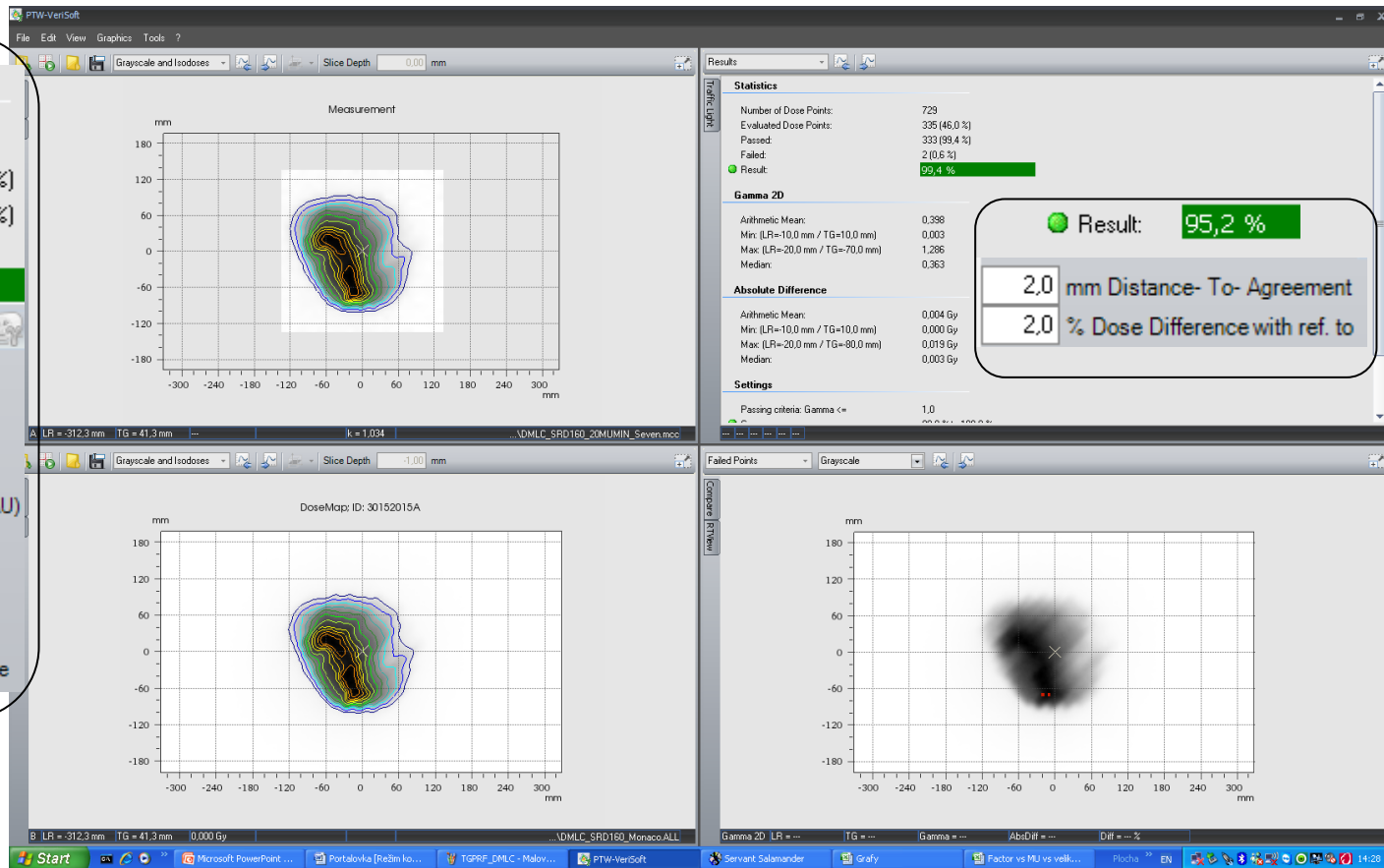
Gamma 2D

3,0 mm Distance- To- Agreement  
3,0 % Dose Difference with ref. to

Local dose  
 Max. dose of calculated volume  
 Selected dose Select 1,00 Gy (or AU)

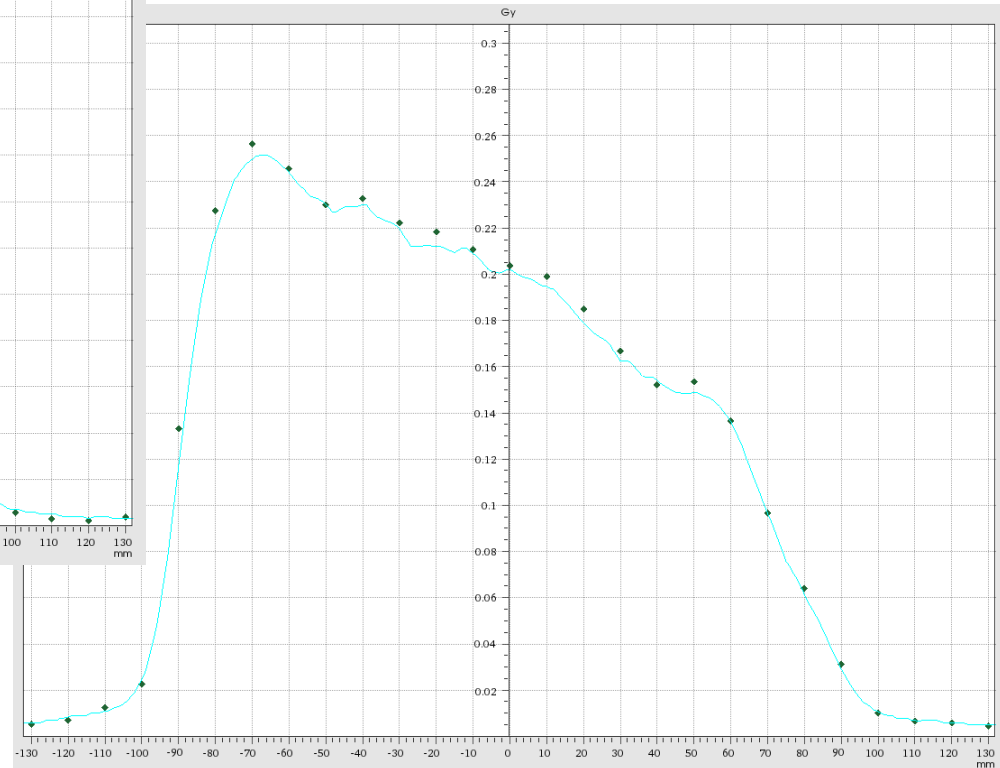
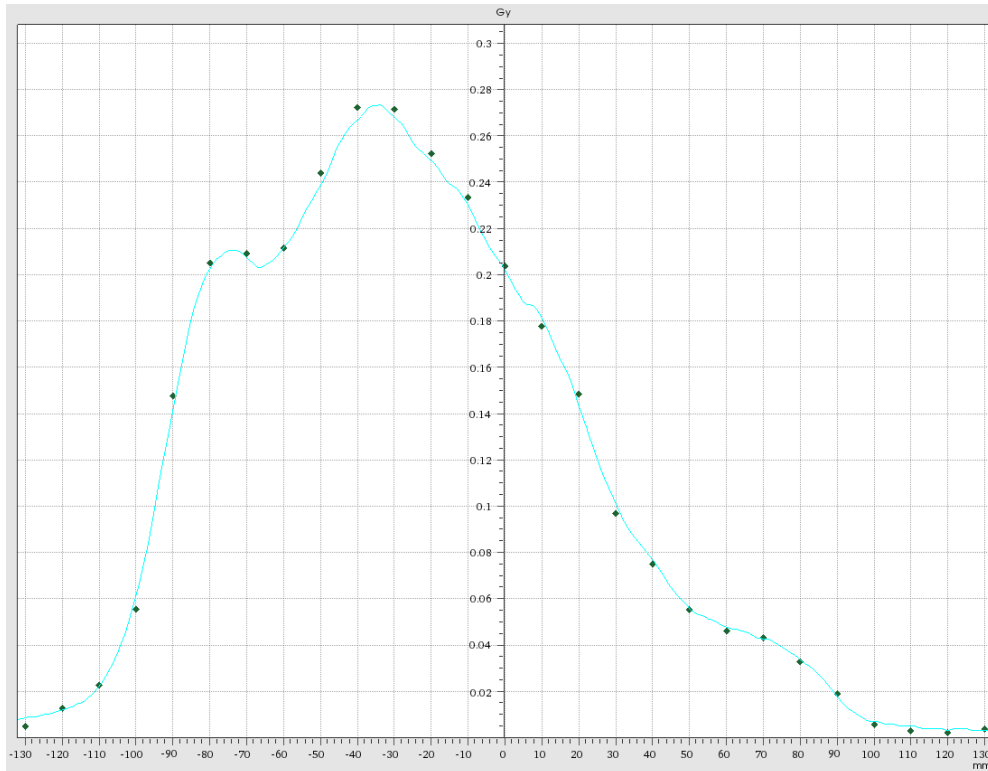
Use increased tolerance of  
5,0 % Dose Diff. for values below  
0,1 Gy (or AU)

Suppress dose below  
5,0 % of max. dose of calculated volume



# Porovnání výpočtu dávky Monaco vs. Seven29

## „volná“ dynamická pole





# Porovnání výpočtu dávky Monaco vs. Seven29 „transmisní“ dynamická pole

### Statistics

Number of Dose Points:	405
Evaluated Dose Points:	299 (73,8 %)
Passed:	279 (93,3 %)
Failed:	20 (6,7 %)
Result:	<b>93,3 %</b>

### Gamma 2D

Gamma 2D

3,0 mm Distance- To- Agreement

3,0 % Dose Difference with ref. to

Local dose

Max. dose of calculated volume

Selected dose Select  Gy (or AU)

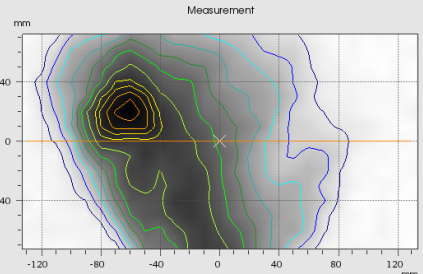
Use increased tolerance of

5,0 % Dose Diff. for values below

0,1 Gy (or AU)

Suppress dose below

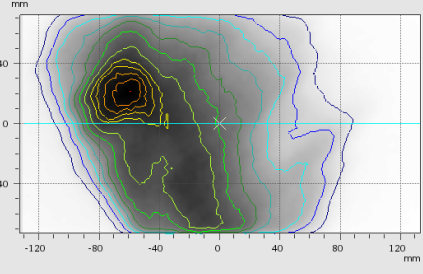
5,0 % of max. dose of calculated volume



Measurement

mm

LR = -39,4 mm TG = 64,6 mm k = 1,034



DoseMap: ID: 15032016

mm

B LR = -39,4 mm TG = 64,6 mm 0,078 Gy

### Results

#### Statistics

Number of Dose Points:	405
Evaluated Dose Points:	299 (73,8 %)
Passed:	279 (93,3 %)
Failed:	20 (6,7 %)
Result:	<b>93,3 %</b>

#### Gamma 2D

Arithmetic Mean:

Min: (LR=-70,0 mm / TG=40,0 mm)

Max: (LR=-130,0 mm / TG=-40,0 mm)

Median:

#### Absolute Difference

Arithmetic Mean:


Min: (LR=80,0 mm / TG=10,0 mm)

Max: (LR=-80,0 mm / TG=-70,0 mm)

Median:

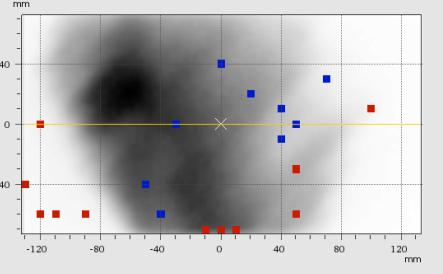
#### Settings

Passing criteria: Gamma <=




### Failed Points

Grayscale



mm

Gamma 2D LR = ... TG = ... Gamma = ... AbsDiff = ... Diff = ... %

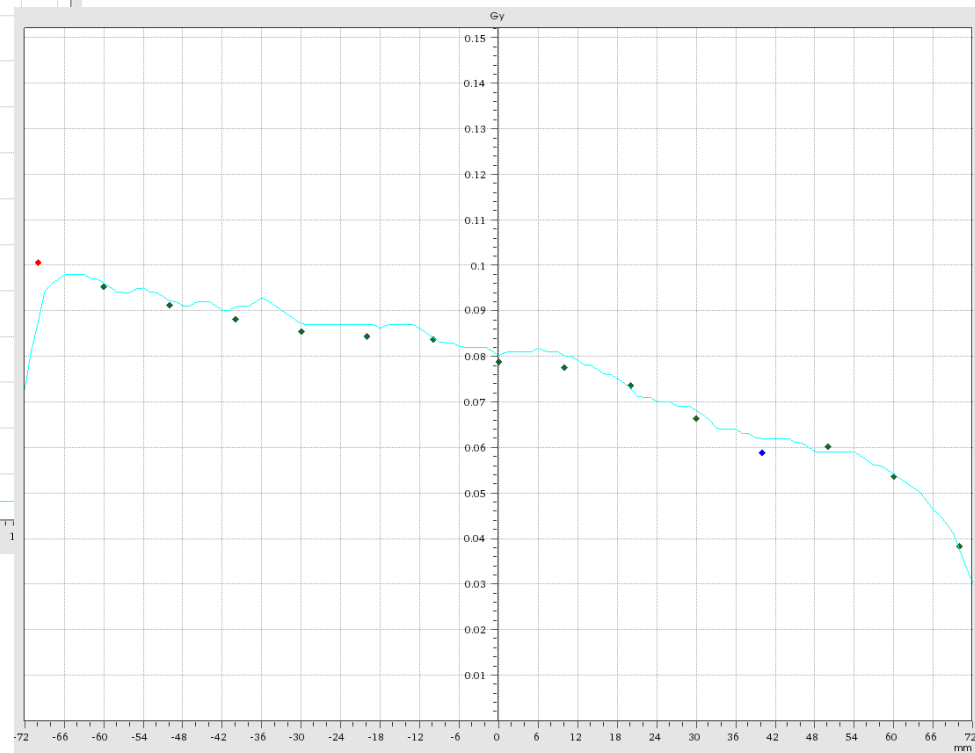
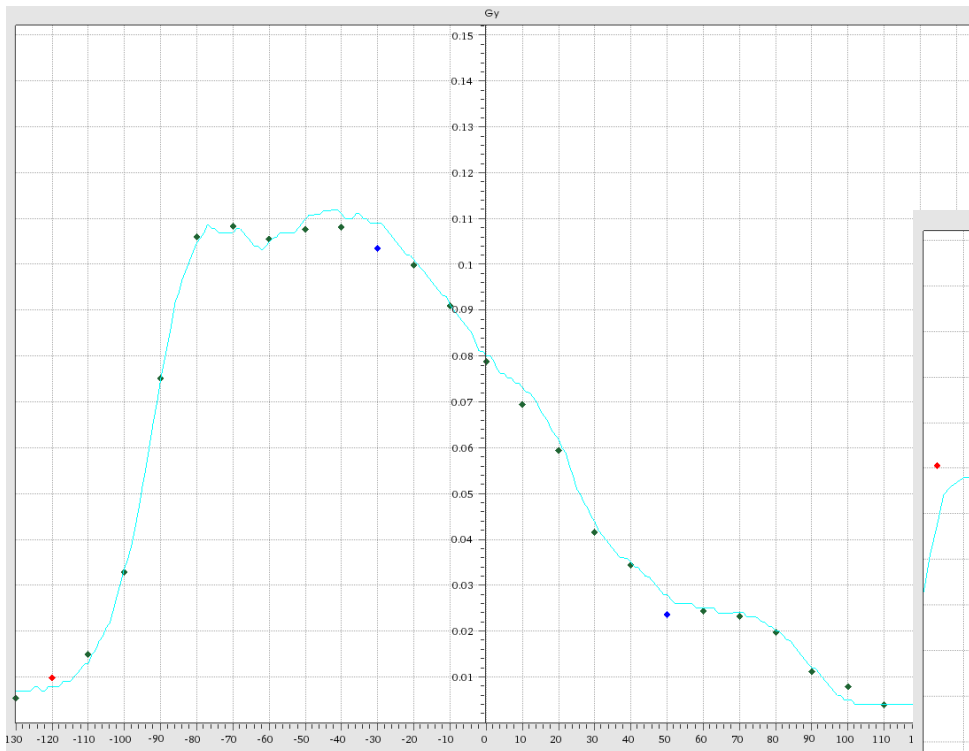


FAKULTNÍ NEMOCNICE  
OLOMOUC

Start | Microsoft PowerPoint | Portalovka [Režim ko... | TGPRF\_DMIC - Malov... | PTW-veriSoft (Neodp... | Servant Salander | Grafy | Factor vs MU vs velk... | Poche EN | 14:53

# Porovnání výpočtu dávky Monaco vs. Seven29

## „transmisní“ dynamická pole

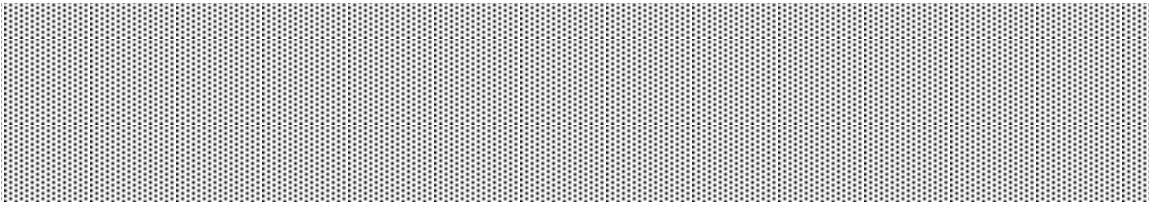


# Materiálové složení detektorové části systému iViewGT



Aluminium

Vzduchová mezera



Měď

Grafit

Lanex Fast™ ( $Gd_2O_2S:Tb$ ) Scintilator

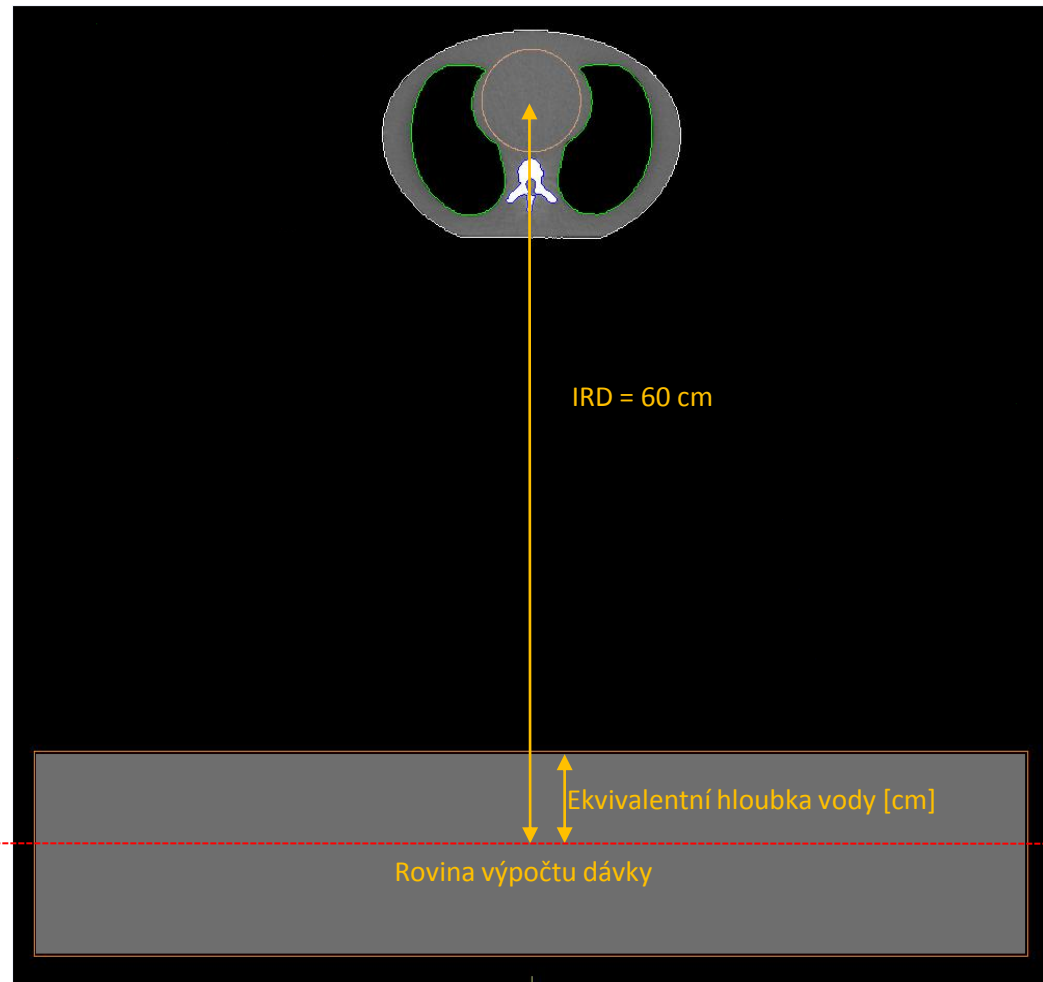
Zeslabovací vrstva

Fotodiody (amorfní Křemík)

# Voděekvivalentní model iViewGT

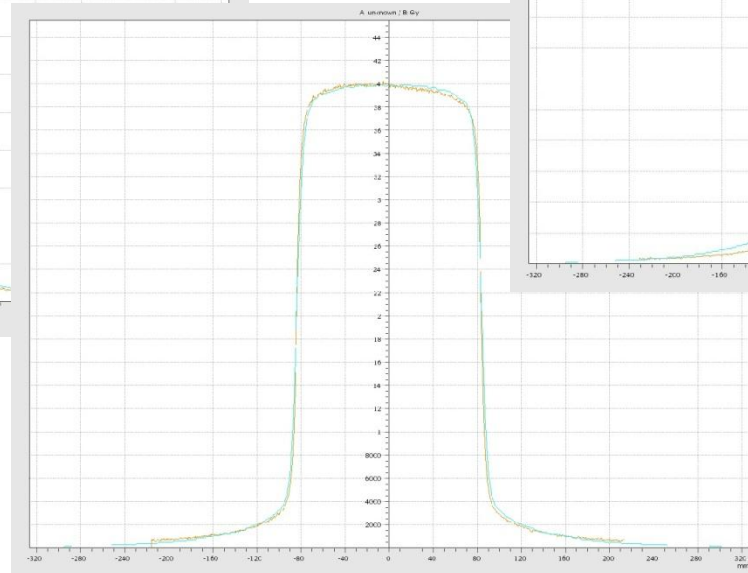
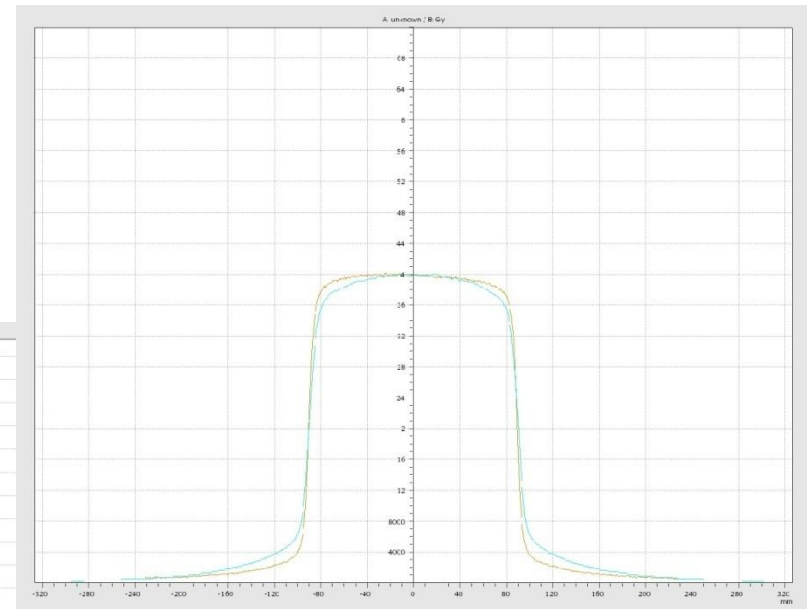
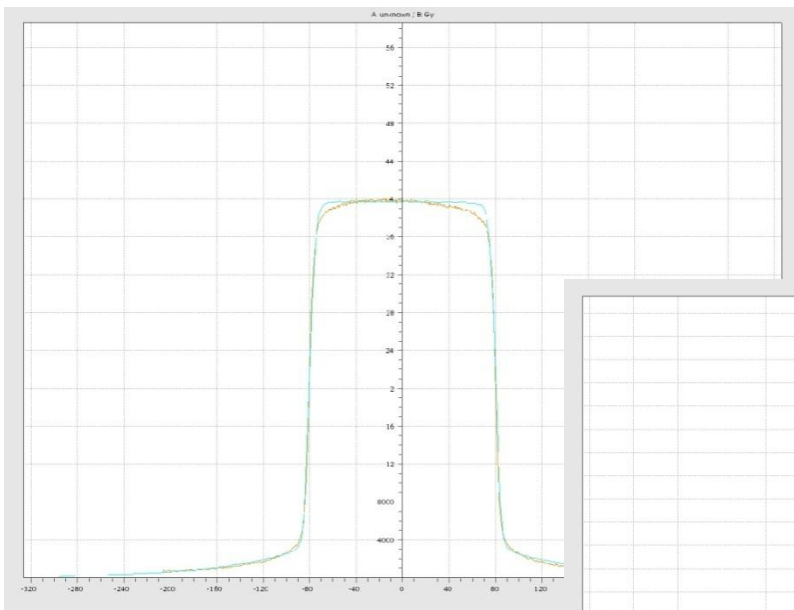


- Aluminium
- Vzduchová mezera
- Měď
- Grafit
- Lanex Fast™ (Gd<sub>2</sub>O<sub>2</sub>S:Tb) Scintillator
- Zeslabovací vrstva
- Fotodiody (amorfní Křemík)



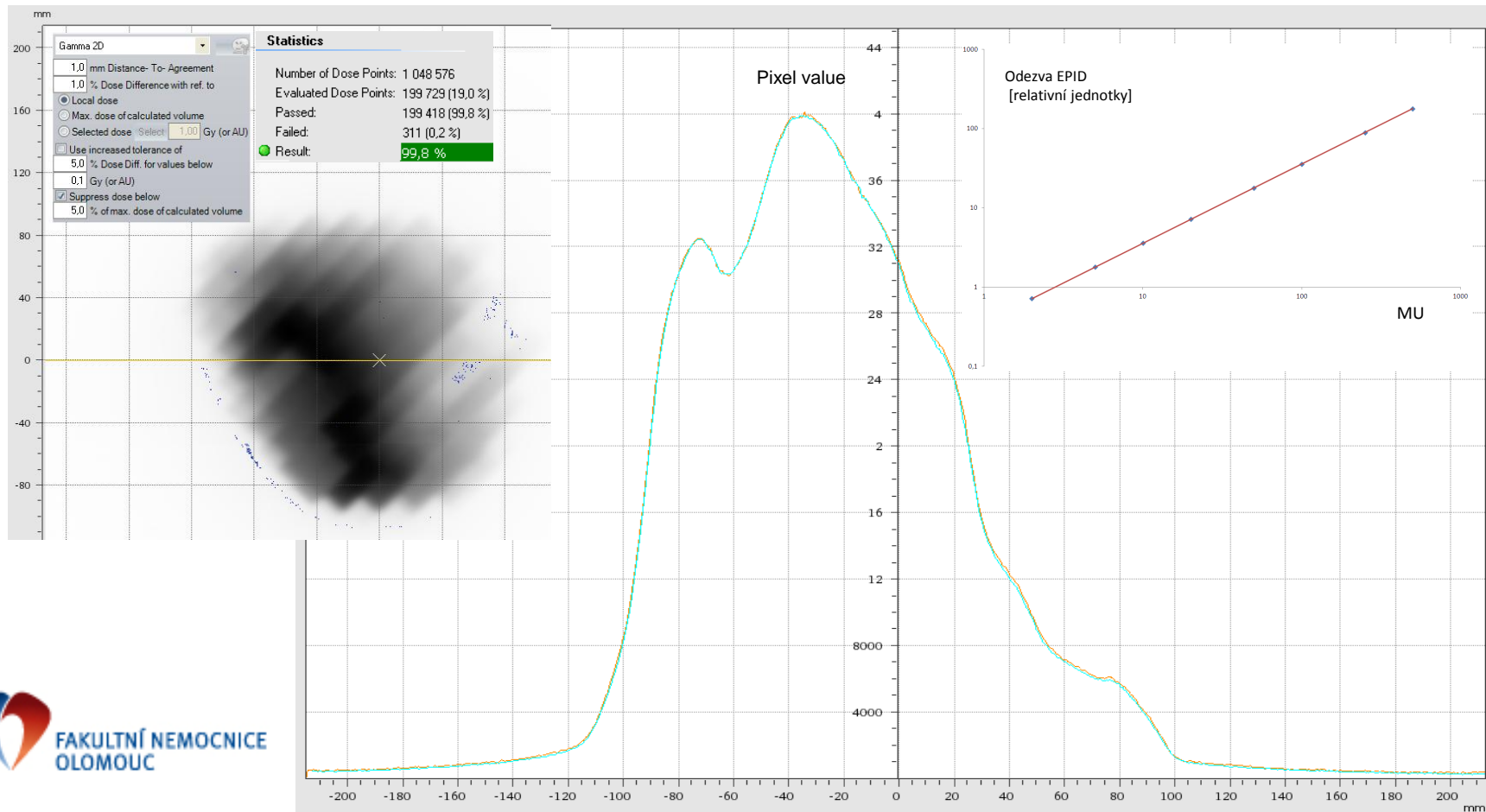
# „Ekvivalentní hloubka vody“

## Výsledky porovnání odezvy iViewGT s výpočtem



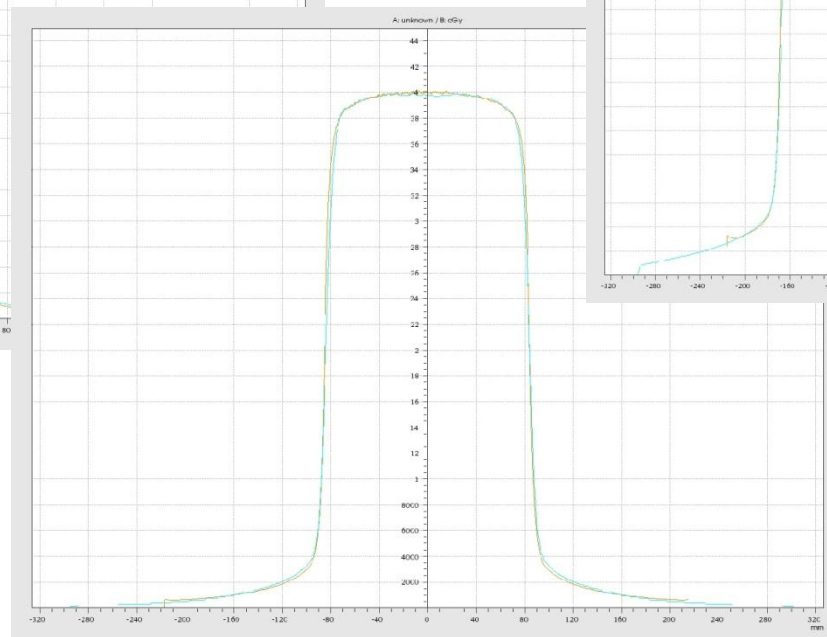
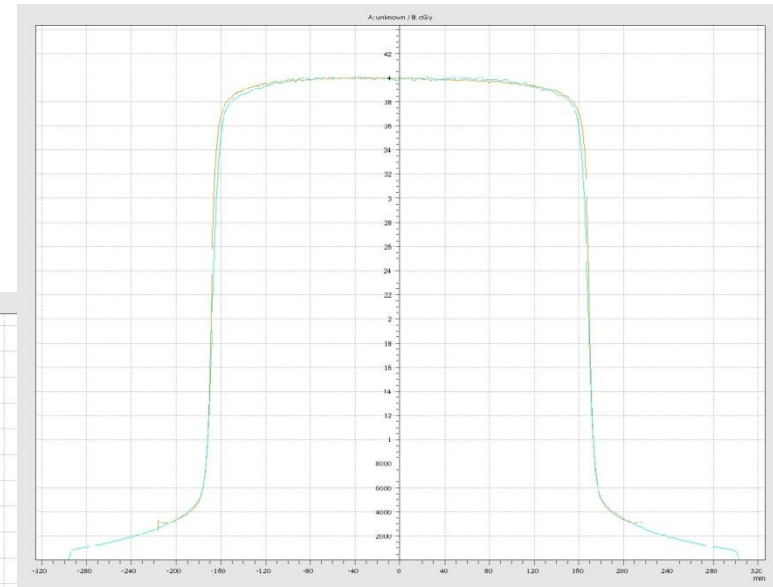
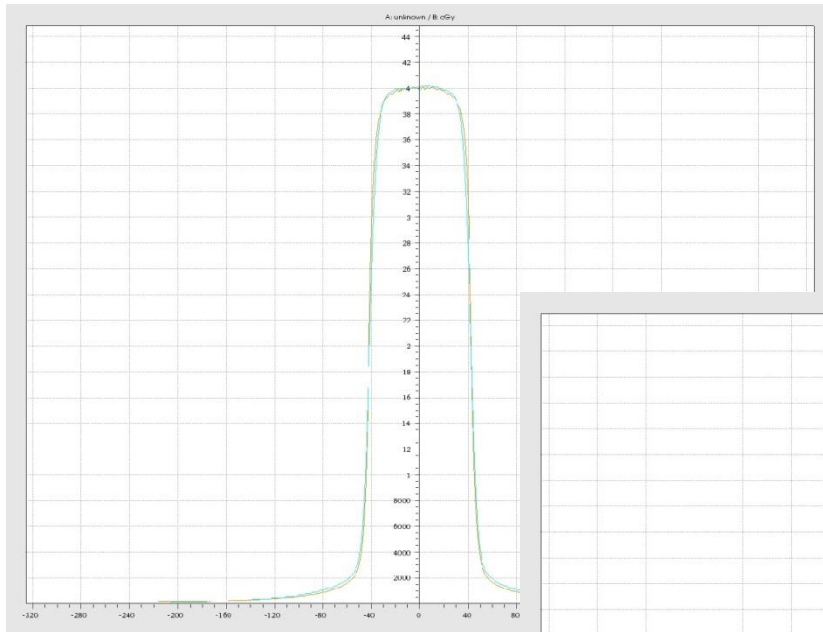
# Odezva EPID

## Linearita a reprodukovatelnost



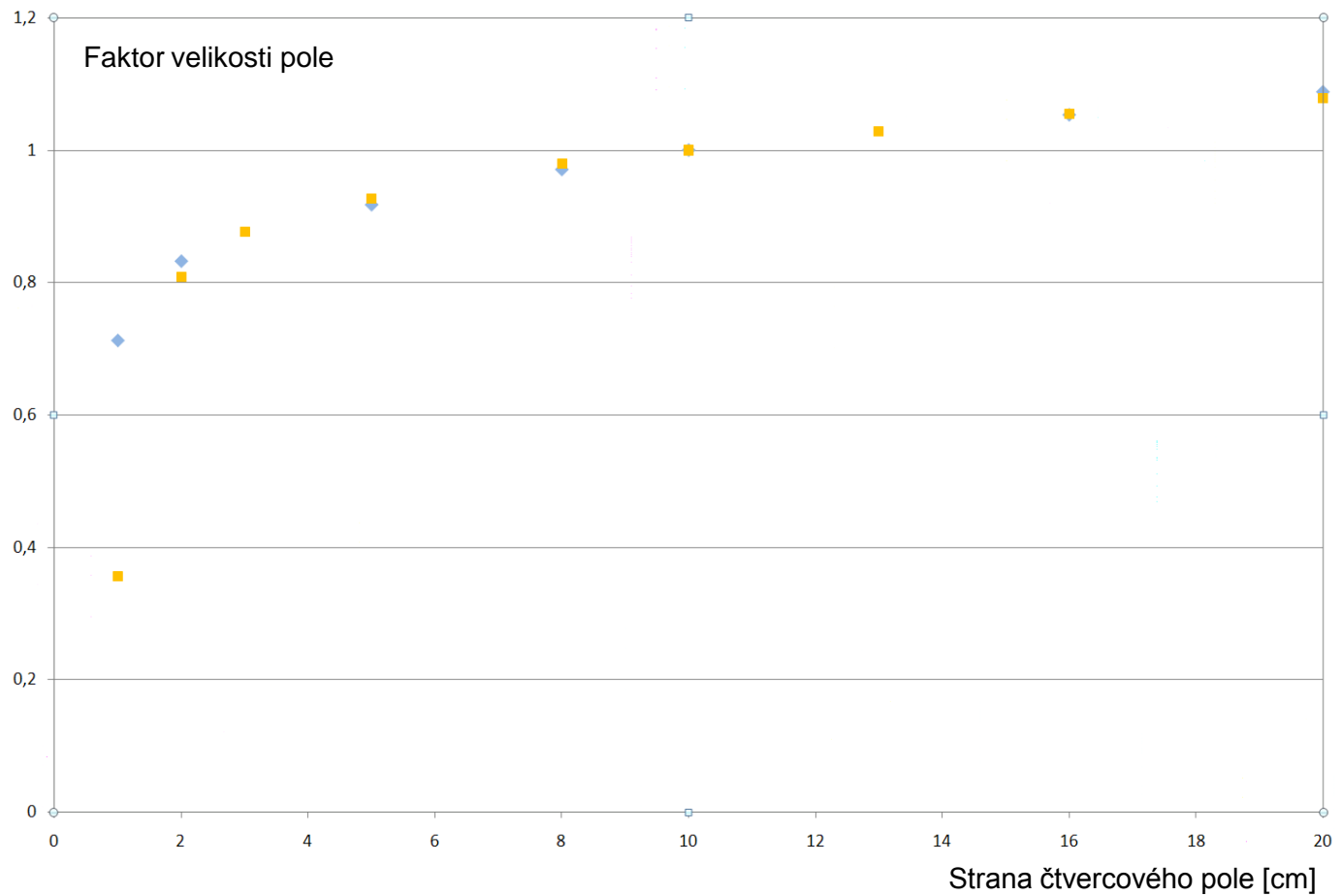
# Odezva EPID

## Vliv velikosti pole



# Odezva EPID

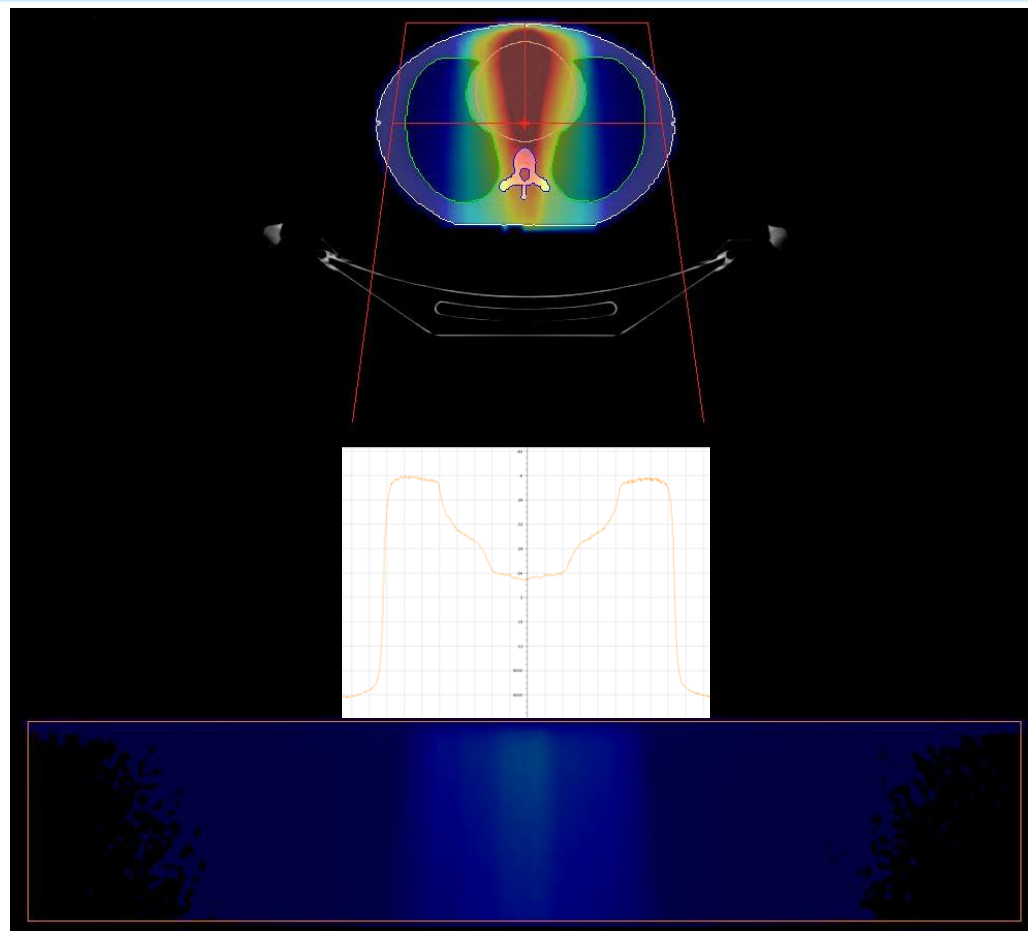
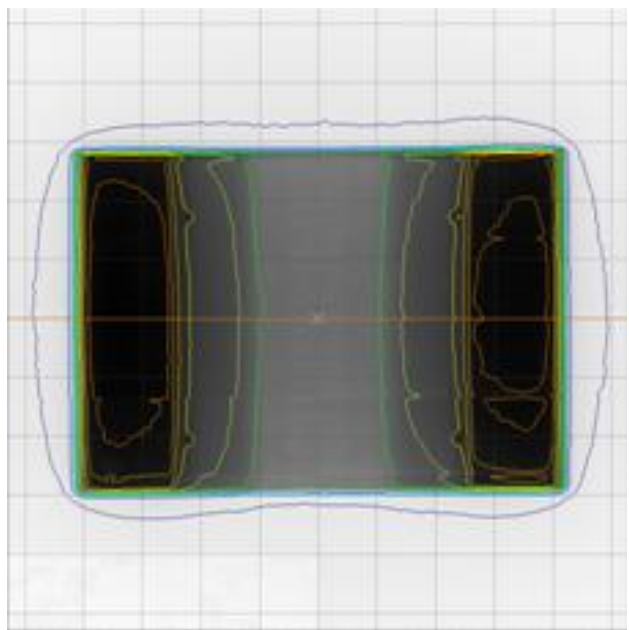
## Vliv velikosti pole





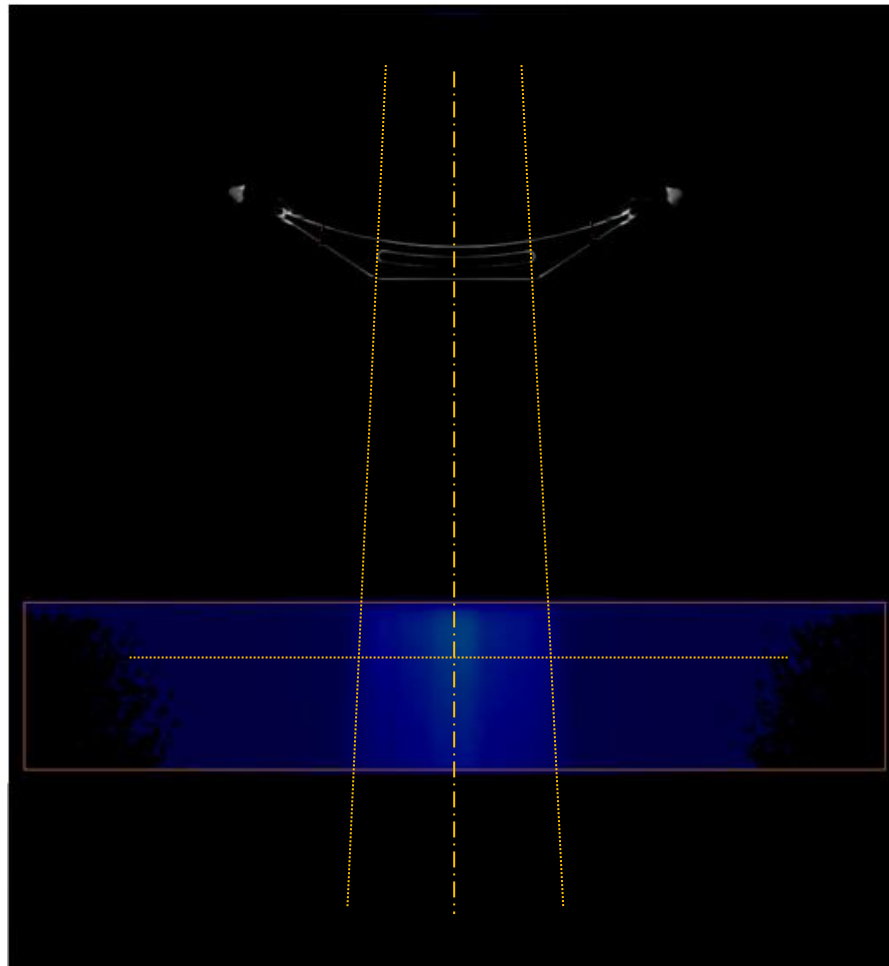
# Odezva EPID

„transmisní“ statické pole



# Odezva EPID ve svazku s modulovanou intenzitou

„přímá“ portálová dozimetrie (bez fantomu)



# Odezva EPID ve svazku s modulovanou intenzitou „přímá“ portálová dozimetrie

**Statistics**

Number of Dose Points:	262 417
Evaluated Dose Points:	34 258 (13,1 %)
Passed:	34 175 (99,8 %)
Failed:	83 (0,2 %)
Result:	99,8 %

**Gamma 2D**

3,0 mm Distance- To- Agreement  
3,0 % Dose Difference with ref. to

Local dose  
 Max. dose of calculated volume  
 Selected dose Select 1,00 Gy (or AU)

Use increased tolerance of  
5,0 % Dose Diff. for values below  
0,1 Gy (or AU)  
 Suppress dose below  
5,0 % of max. dose of calculated volume

**Results**

**Gamma 2D**

95,3 %

Gamma 2D  
2,0 mm Distance- To- Agreement  
2,0 % Dose Difference with ref. to

**Failed Points**

Gamma 2D LR = 163,2 mm TG = 49,3 mm Gamma = not evalu. AbsDif = 0,000 Gy Dif = 0,000 %

**PTW-Versoft**

File Edit View Graphics Tools ?

Grayscale and Isodoses Slice Depth 0,00 mm

TIFF-Image: ID:

mm

TIFF-Image: ID: 30152015A

mm

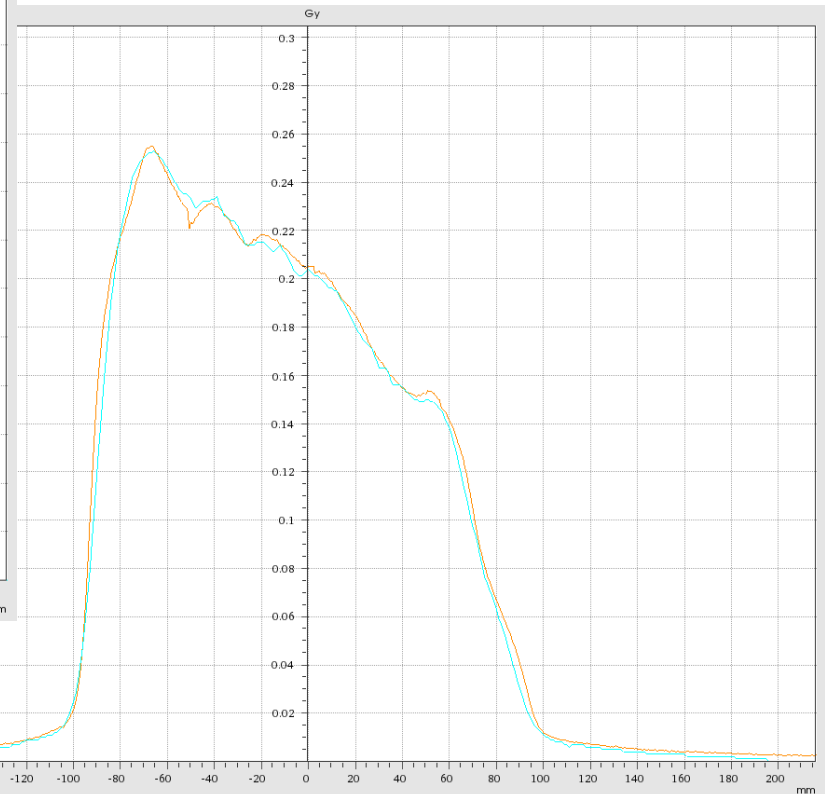
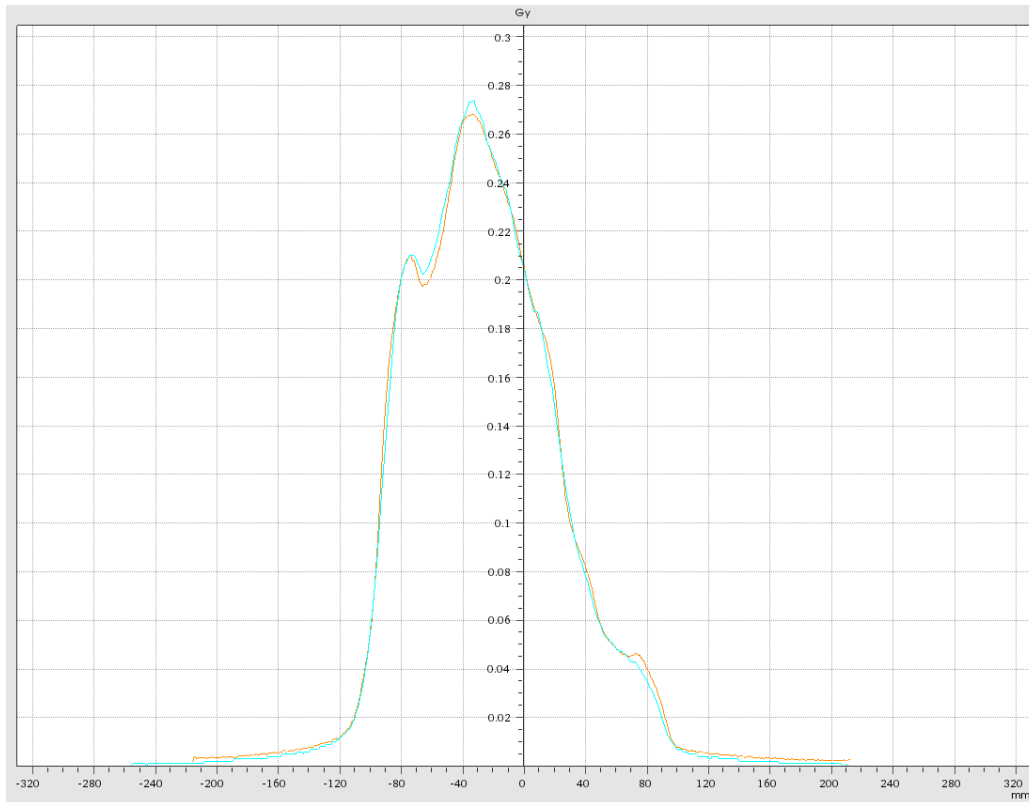
Grayscale and Isodoses Slice Depth 1,00 mm

mm

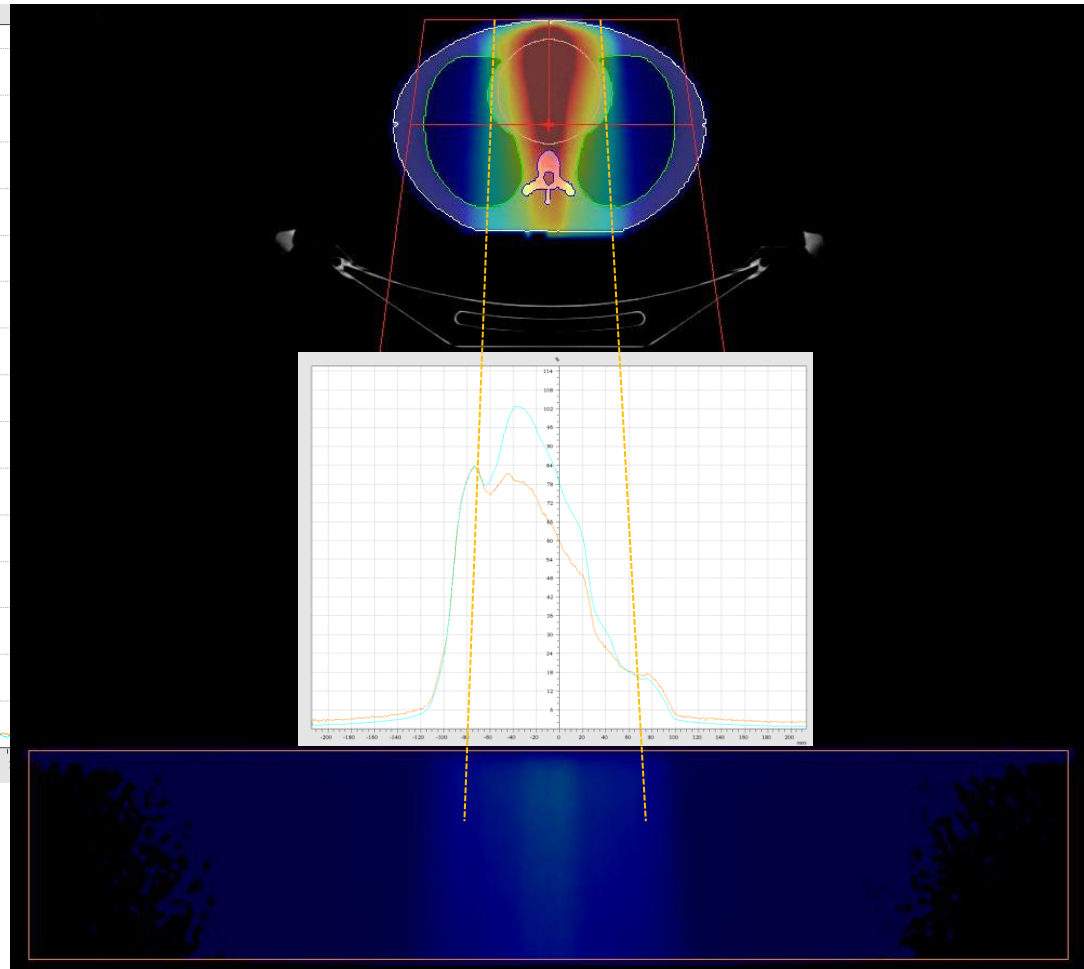
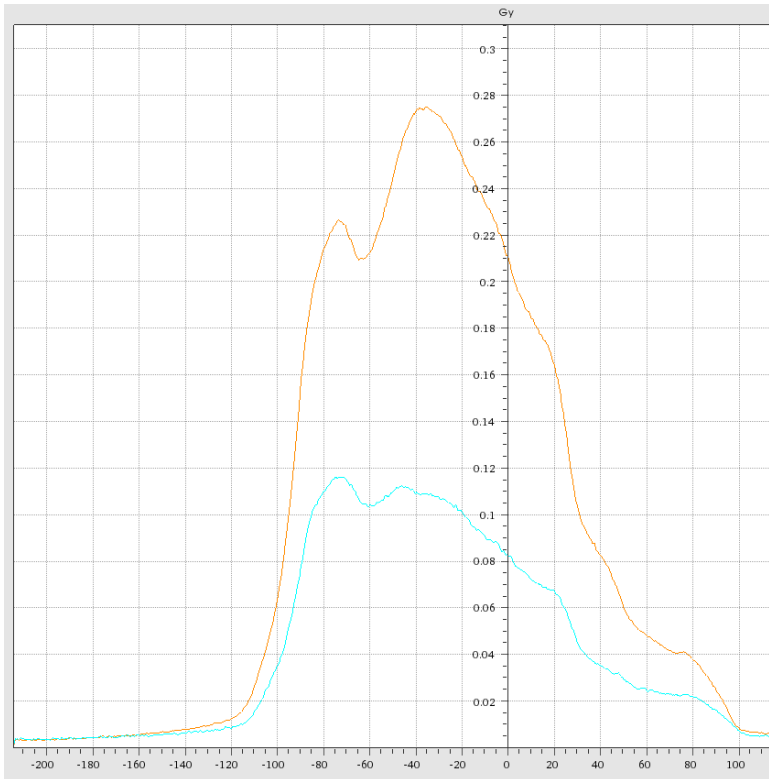
Start Microsoft PowerPoint Portalovka [Režim ko... TGPRF\_DMLC - Malov... PTW-Versoft

Placha CS 12:14

# Odezva EPID ve svazku s modulovanou intenzitou „přímá“ portálová dozimetrie



# Odezva EPID ve svazku s modulovanou intenzitou transmisní portálová dozimetrie



# Odezva EPID ve svazku s modulovanou intenzitou transmisní portálová dozimetrie

**Statistics**

Number of Dose Points:	59 784
Evaluated Dose Points:	28 769 (48,1 %)
Passed:	27 029 (94,0 %)
Failed:	1 740 (6,0 %)
<b>Result:</b>	<b>94,0 %</b>

Gamma 2D

3,0 mm Distance- To- Agreement

3,0 % Dose Difference with ref. to

Local dose

Max. dose of calculated volume

Selected dose  Gy (or AU)

Use increased tolerance of

5,0 % Dose Diff. for values below

0,1 Gy (or AU)

Suppress dose below

5,0 % of max. dose of calculated volume

The screenshot displays the PTW-Versoft software interface. The main window shows a dose distribution plot (TIFF-Image) with a central peak and surrounding contours. The plot axes range from -200 to 200 mm. The status bar at the bottom of the main window indicates: LR = 154,0 mm, TG = 44,9 mm, 0,004 Gy, lrx = 0,004 Gy, and the file path is ...DMLC\_CIRS\_20muuriSSD165 normalized to seven.tif.

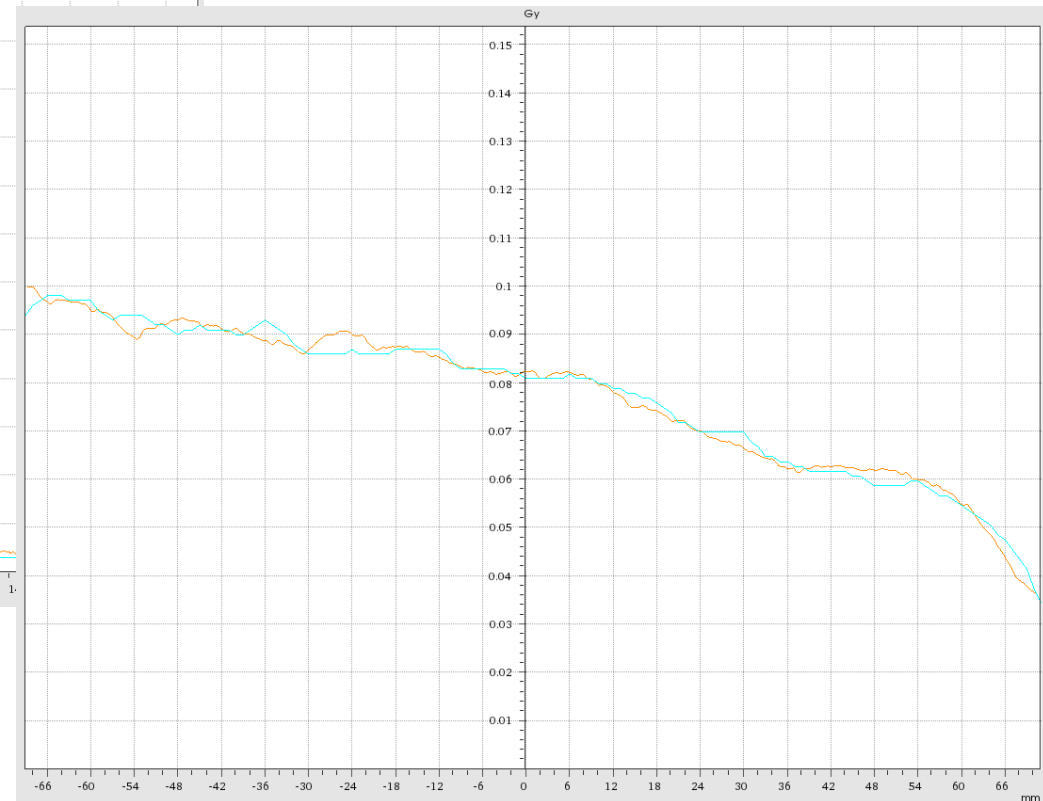
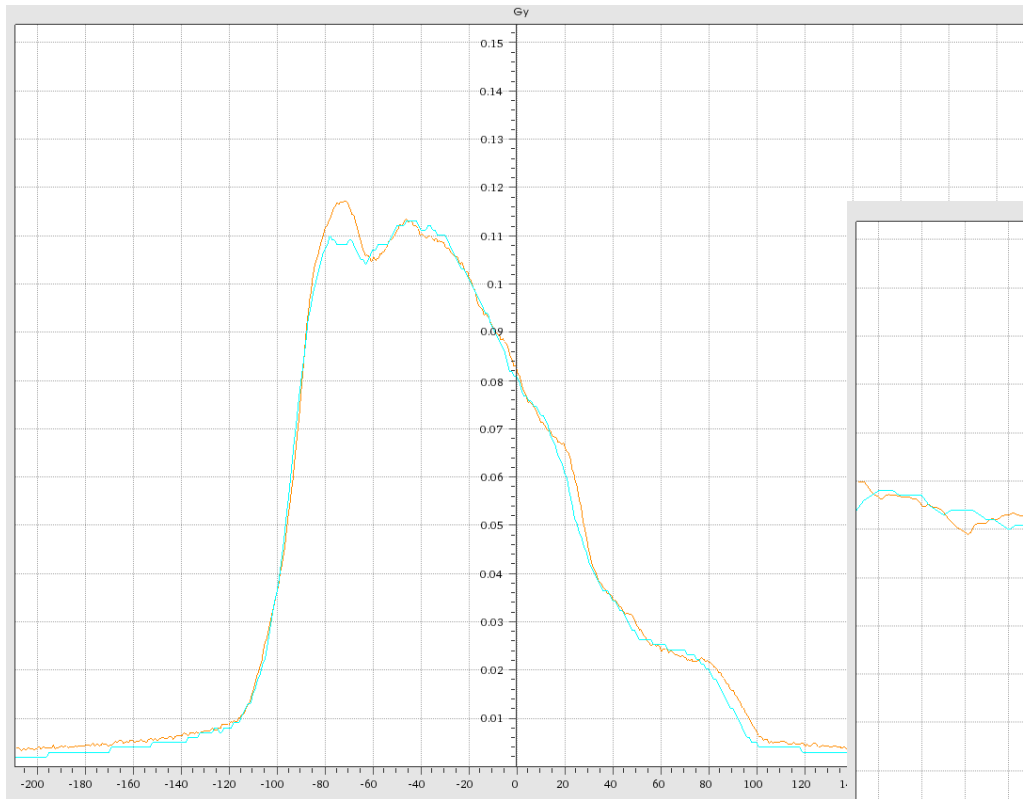
The Results panel on the right provides the following data:

<b>Statistics</b>	
Number of Dose Points:	59 784
Evaluated Dose Points:	28 769 (48,1 %)
Passed:	27 029 (94,0 %)
Failed:	1 740 (6,0 %)
<b>Result:</b>	<b>94,0 %</b>
<b>Gamma 2D</b>	
Arithmetic Mean:	0,582
Min (LR=56,0 mm / TG=29,0 mm):	0,000
Max (LR=75,0 mm / TG=65,0 mm):	12,949
Median:	0,352
<b>Absolute Difference</b>	
Arithmetic Mean:	0,003 Gy
Min (LR=35,0 mm / TG=67,0 mm):	0,000 Gy
Max (LR=15,0 mm / TG=69,0 mm):	0,101 Gy
Median:	0,002 Gy
<b>Settings</b>	
Passing criteria: Gamma <=	1,0

The Failed Points panel at the bottom right shows a grayscale plot of the failed points, with a status bar indicating: Gamma 2D LR = 154,0 mm, TG = 44,9 mm, Gamma = not evalu., AbsDif = 0,000 Gy, Dif = 0,000 %.

The Windows taskbar at the bottom shows the Start button and several open applications: PTW-Versoft (Neop...), Servant Salamander, Microsoft PowerPoint..., Portálková [Režim ko...], TGPFF\_DMIC - Malov..., and Plocha.

# Odezva EPID ve svazku s modulovanou intenzitou transmisní portálová dozimetrie



# Závěr



1. Automatické řízení citlivosti - cílem je udržet „konstantní“ odezvu receptoru

2. Nepřesná poloha receptoru