



# Monte-Carlo Beam Data Verification Audit Report

**- EXAMPLE -**

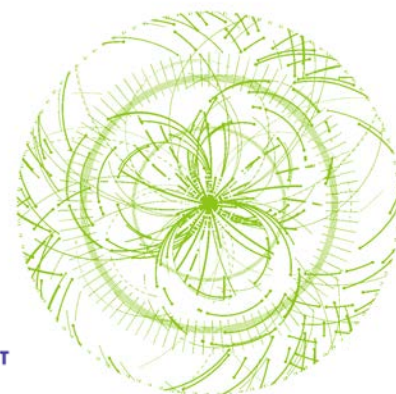
2020/03/11

Beam Model Name: ICCVersa6MV  
Beam Model ID: 01  
Beam Model Code: 8827

Beam Model Type: Elekta AG 6MV

Customer Name: IBA ICC  
Customer ID: 0033

Verification software: SVN r2714



## General Comments

Small field DDCs 20mmx20mm and 30mmx30mm were diode measurements, those were ignored in the fit. Note that small-field OF- and DDC-measurements used a shielded diode (PTW DiodeP), while PTW recommends using the unshielded version (DiodeE) for such measurements.

## Absolute dose calibration

MU calibration conditions:

- Field Size X: 100.00 mm
- Field Size Y: 100.00 mm
- MU calibration SSD: 900.00 mm
- MU calibration Depth: 100.00 mm

Dose per 100 MU:

measured value [Gy]	calculated value [Gy]	difference [%]
1.000000	0.999106	-0.1

Comment:

-no comment-

## Relative output factors

Measurement conditions:

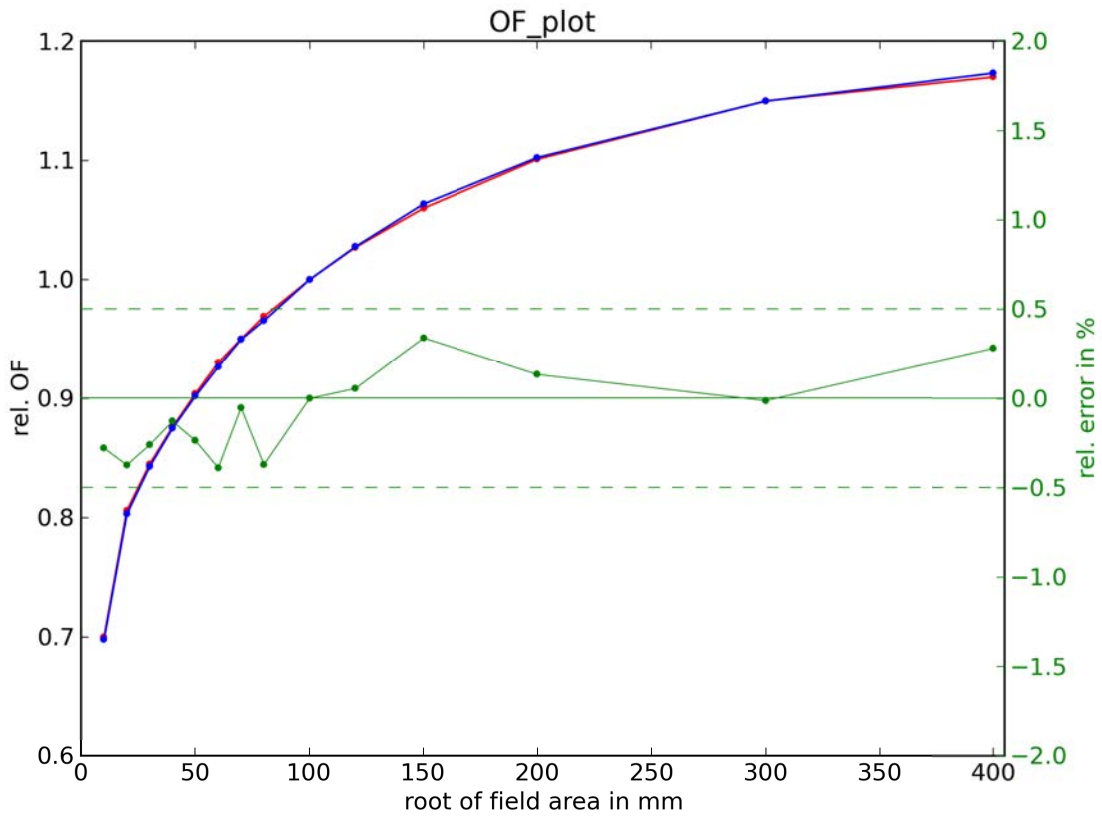
- SSD: 900.00 mm
- Measurement depth: 100.00 mm
- Leaf placement policy: Guard Leaf (Agility)
- Reference field: 100.00 mm × 100.00 mm

OF-data as entered into the Import-tool:

field X [mm]	field Y [mm]	output factor	detector	detector correction factor
10.00	10.00	0.700000	PTW shielded Diode	1.000000
20.00	20.00	0.806000	PTW shielded Diode	1.000000
30.00	30.00	0.845000	PTW shielded Diode	1.000000
40.00	40.00	0.876000	PTW shielded Diode	1.000000
50.00	50.00	0.904000	PTW shielded Diode	1.000000
60.00	60.00	0.930000	IC 0.125 ccm	1.000000
70.00	70.00	0.950000	IC 0.125 ccm	1.000000
80.00	80.00	0.969000	IC 0.125 ccm	1.000000
100.00	100.00	1.000000	IC 0.125 ccm	1.000000
120.00	120.00	1.027000	IC 0.125 ccm	1.000000
150.00	150.00	1.060000	IC 0.125 ccm	1.000000
200.00	200.00	1.101000	Other cylindrical IC	1.000000
300.00	300.00	1.150000	IC 0.125 ccm	1.000000
400.00	400.00	1.170000	IC 0.125 ccm	1.000000

Relative output factors:

field X [mm]	field Y [mm]	rel. OF (measured)	rel. OF (calculated)	difference [%]
10.00	10.00	0.700000	0.698055	-0.3
20.00	20.00	0.806000	0.802998	-0.4
30.00	30.00	0.845000	0.842809	-0.3
40.00	40.00	0.876000	0.874877	-0.1
50.00	50.00	0.904000	0.901865	-0.2
60.00	60.00	0.930000	0.926389	-0.4
70.00	70.00	0.950000	0.949506	-0.1
80.00	80.00	0.969000	0.965417	-0.4
100.00	100.00	1.000000	1.000000	0.0
120.00	120.00	1.027000	1.027569	0.1
150.00	150.00	1.060000	1.063591	0.3
200.00	200.00	1.101000	1.102476	0.1
300.00	300.00	1.150000	1.149858	-0.0
400.00	400.00	1.170000	1.173269	0.3



red: measurement; blue: simulation; green: rel. error  
Note that this plot only shows OF data of *square* fields.

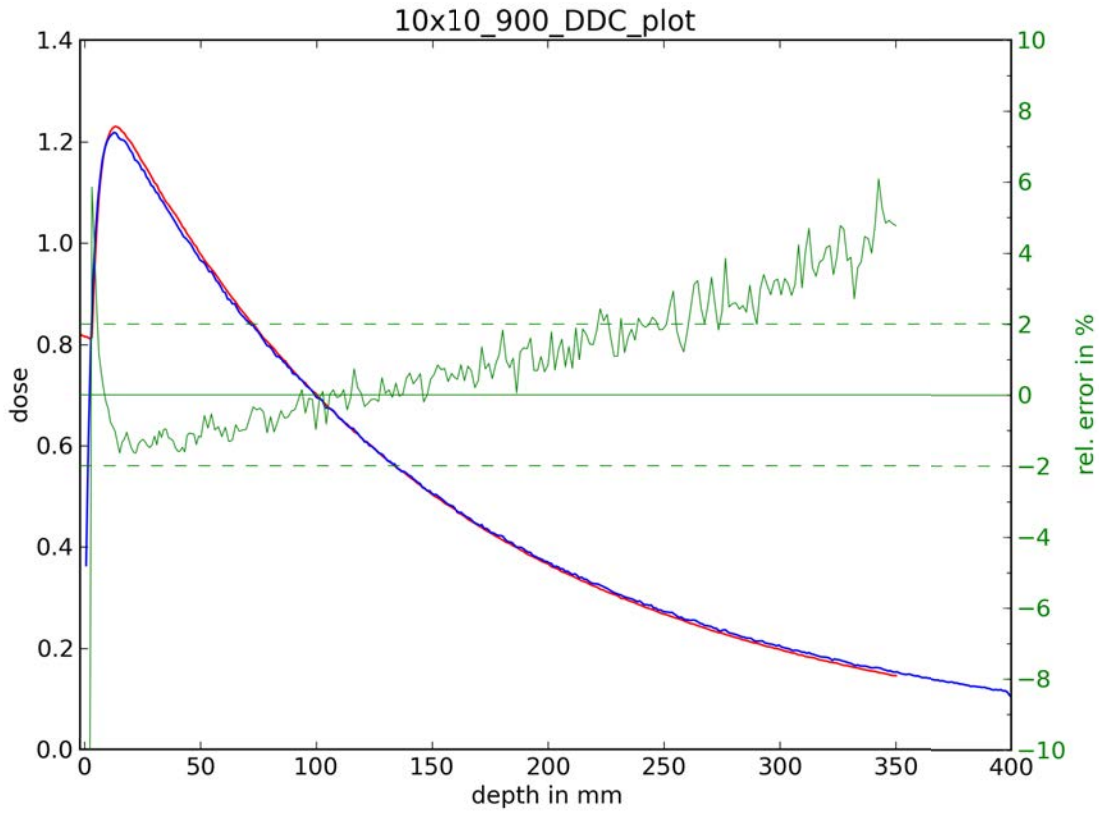
Comment:  
-no comment-

## DDCs

Comment:

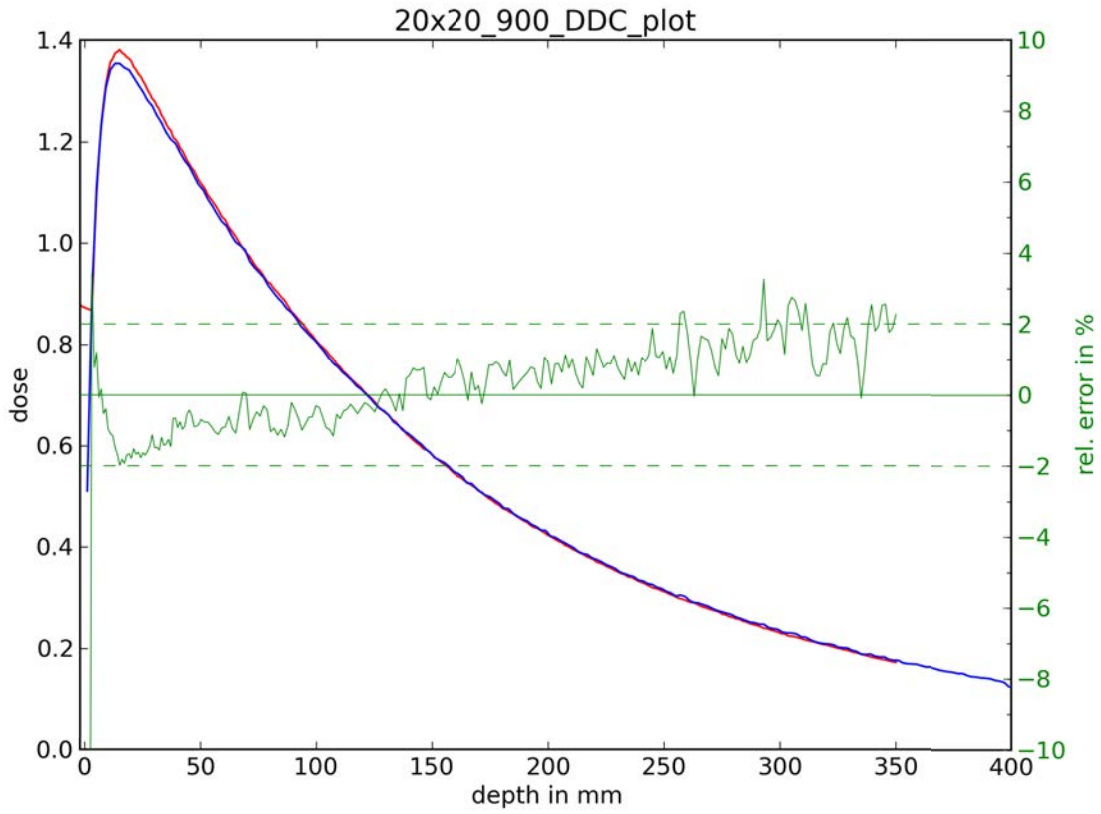
-no comment-

Depth Dose: field size 10x10 mm (PTW 60016 Diode P)



red: measurement; blue: simulation; green: rel. error

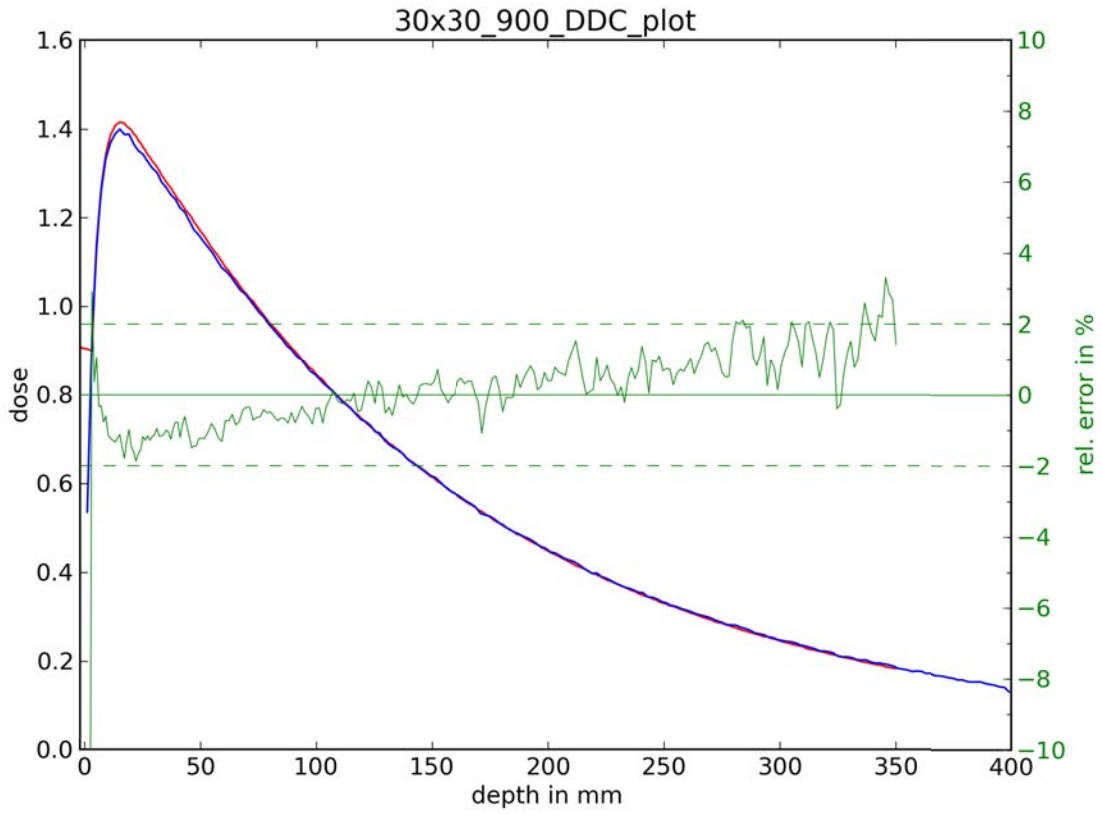
Depth Dose: field size 20x20 mm (PTW 60016 Diode P)



red: measurement; blue: simulation; green: rel. error

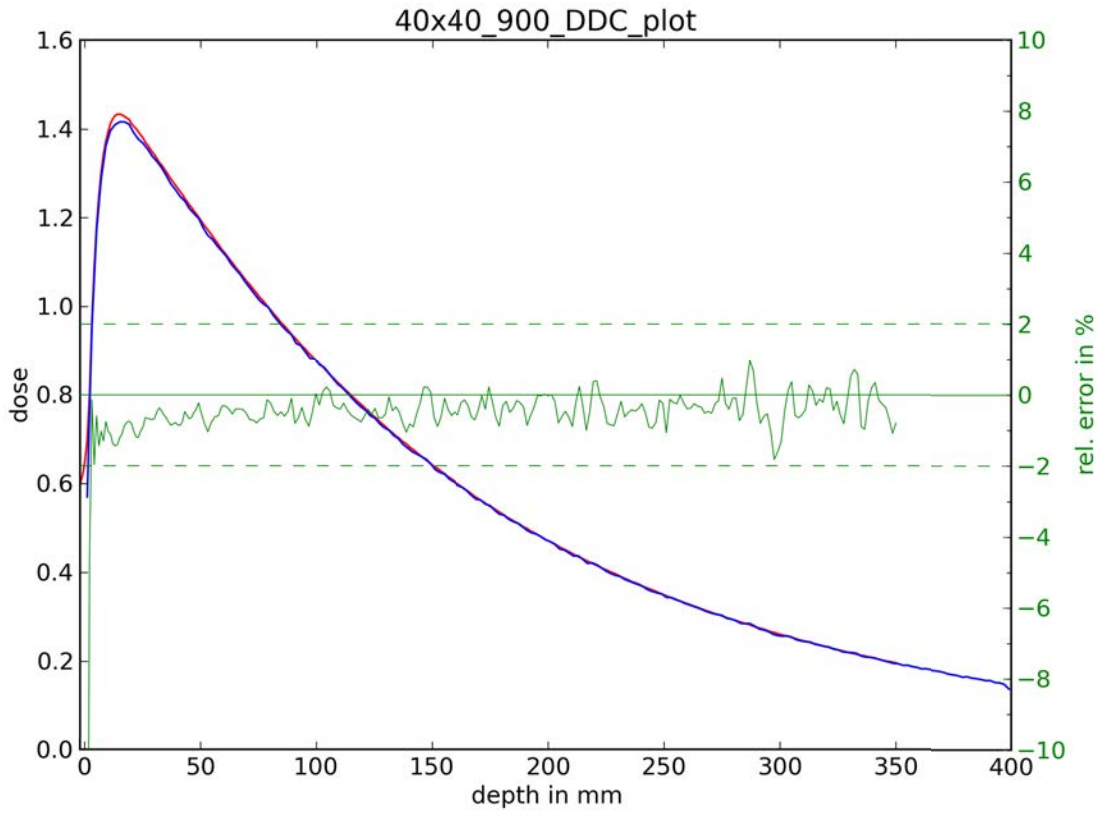


Depth Dose: field size 30x30 mm (PTW 60016 Diode P)



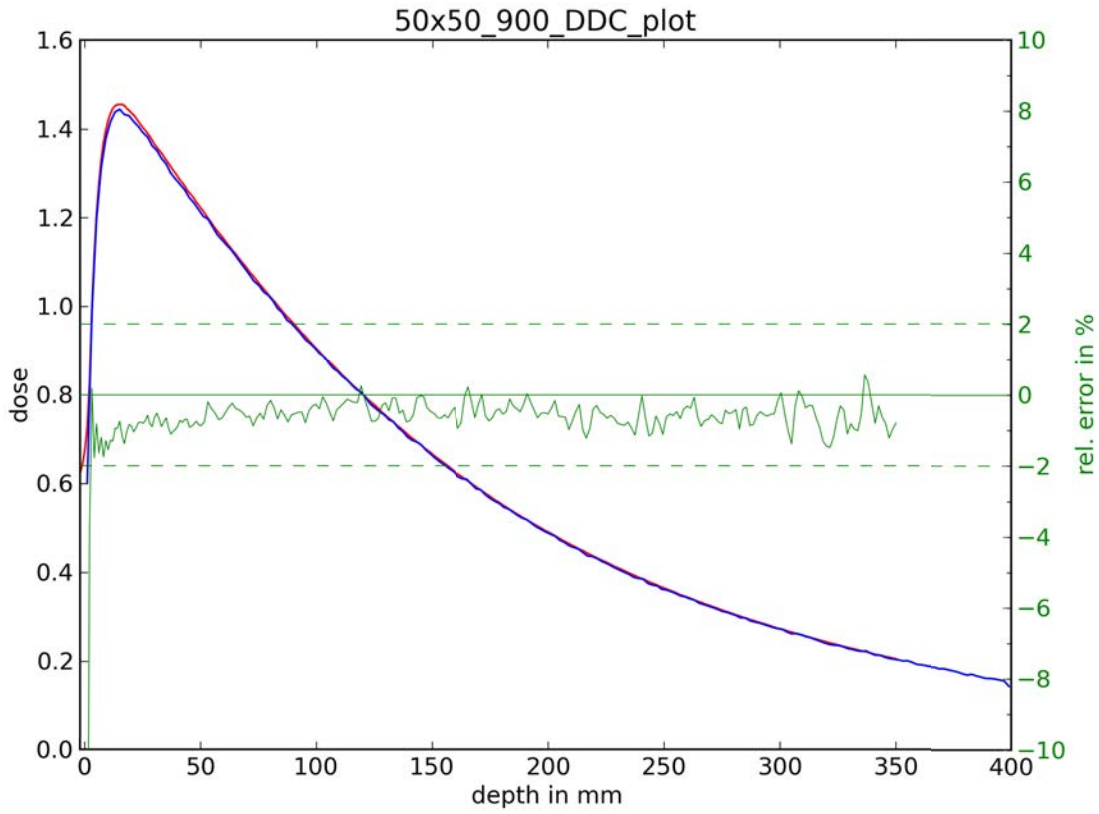
red: measurement; blue: simulation; green: rel. error

Depth Dose: field size 40x40 mm (PTW 31010 Semiflex)



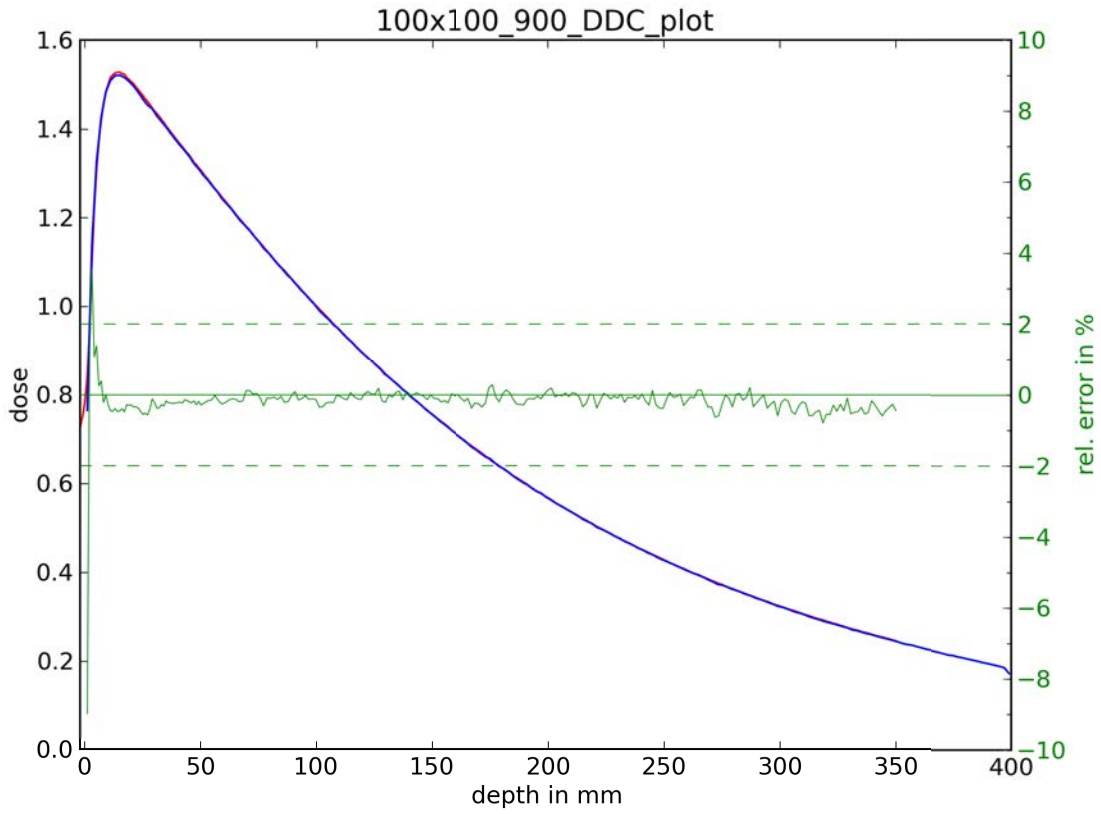
red: measurement; blue: simulation; green: rel. error

**Depth Dose: field size 50x50 mm (PTW 31010 Semiflex)**



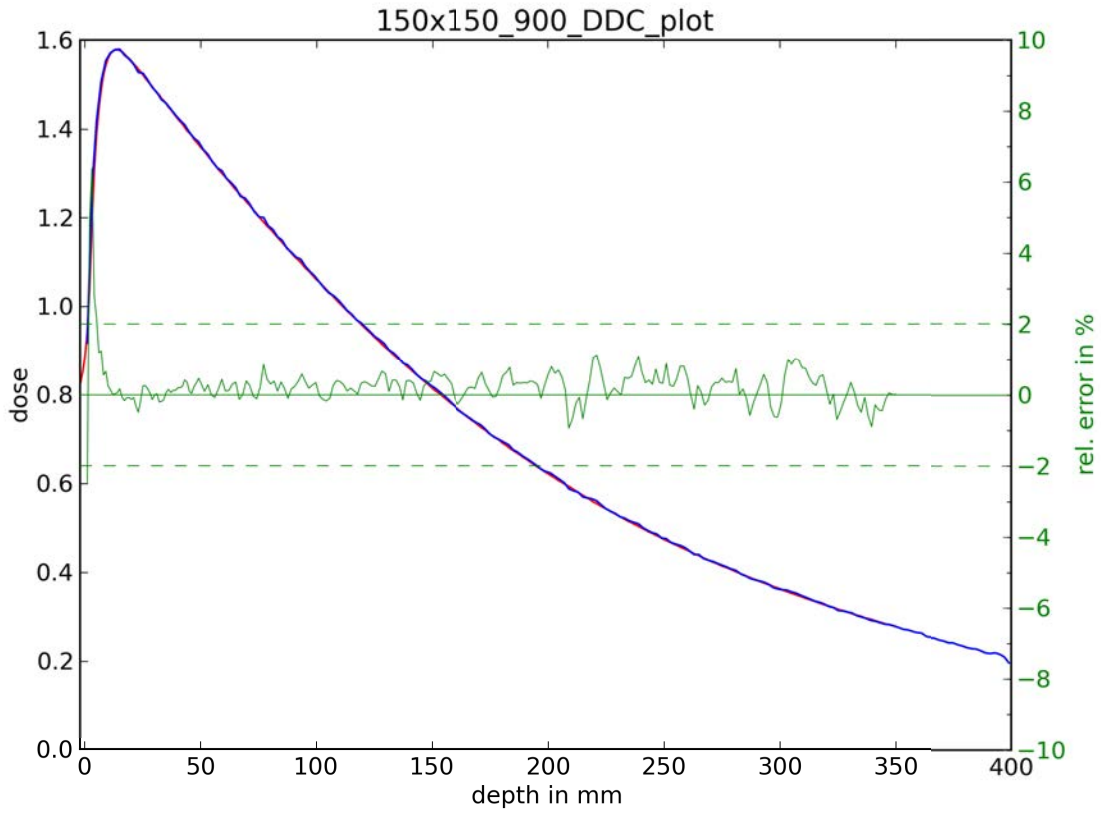
red: measurement; blue: simulation; green: rel. error

Depth Dose: field size 100x100 mm (PTW 31010 Semiflex)



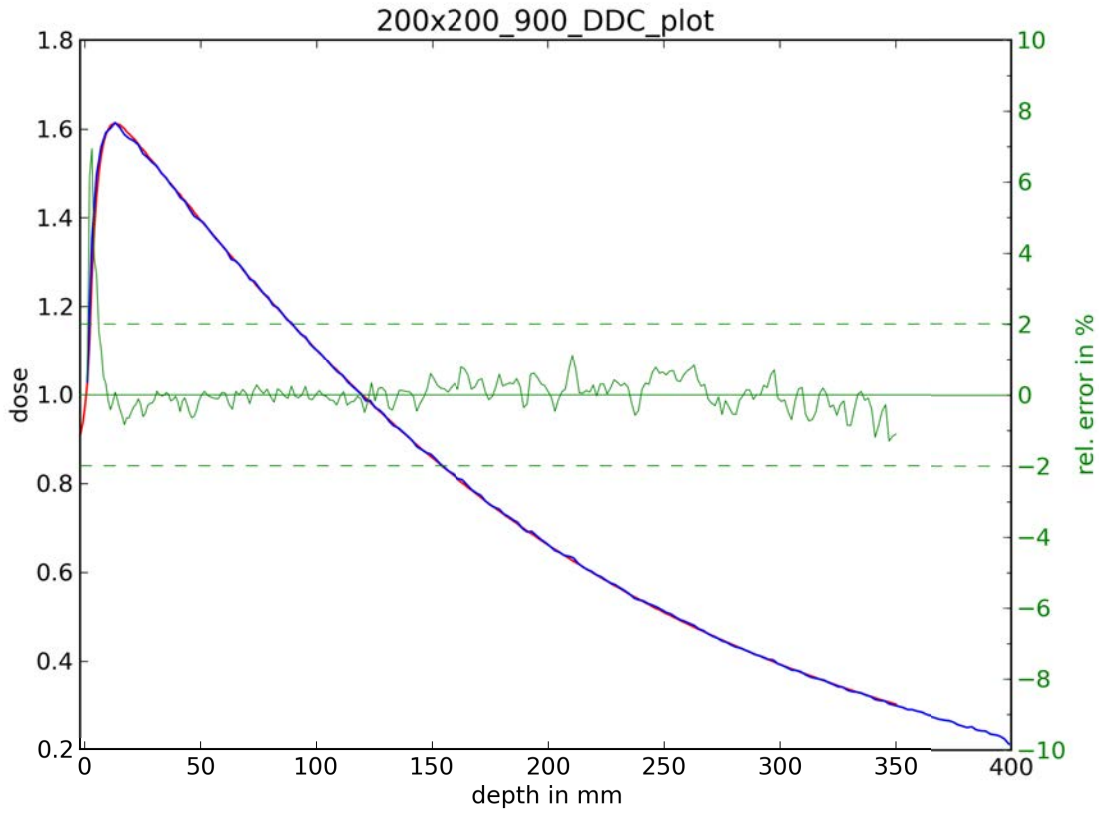
red: measurement; blue: simulation; green: rel. error

Depth Dose: field size 150x150 mm (PTW 31010 Semiflex)



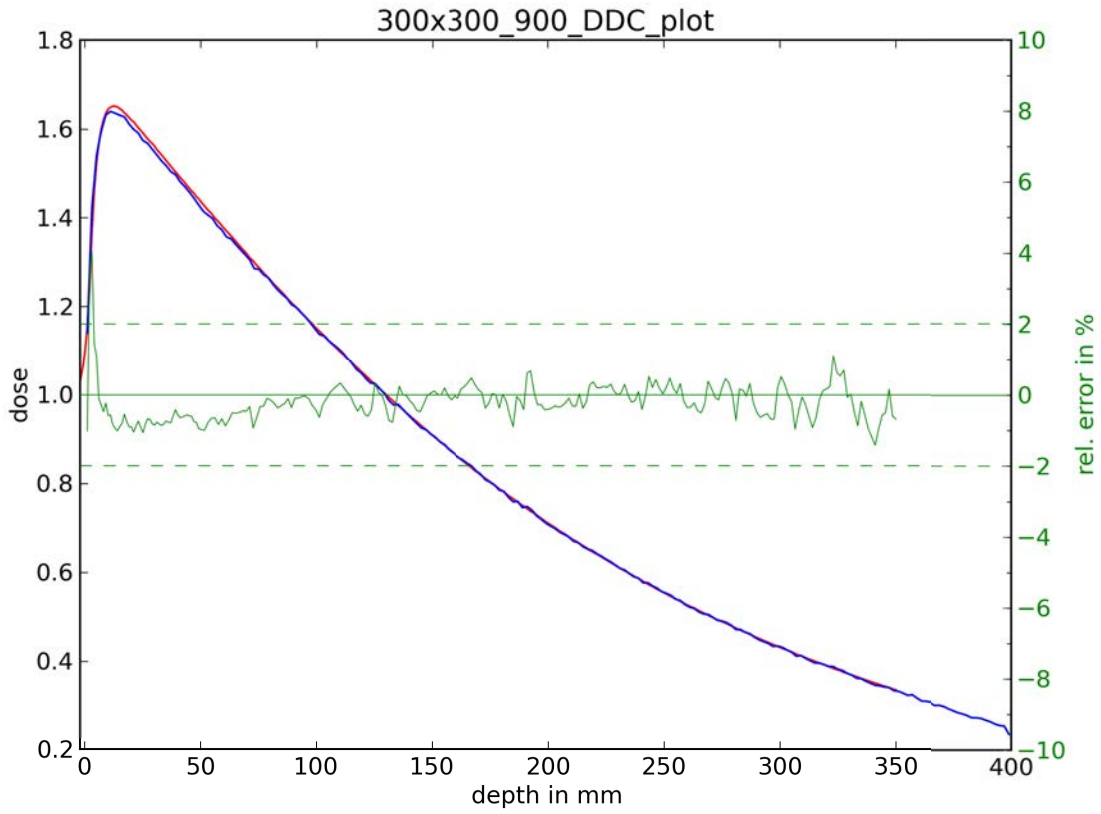
red: measurement; blue: simulation; green: rel. error

Depth Dose: field size 200x200 mm (PTW 31010 Semiflex)



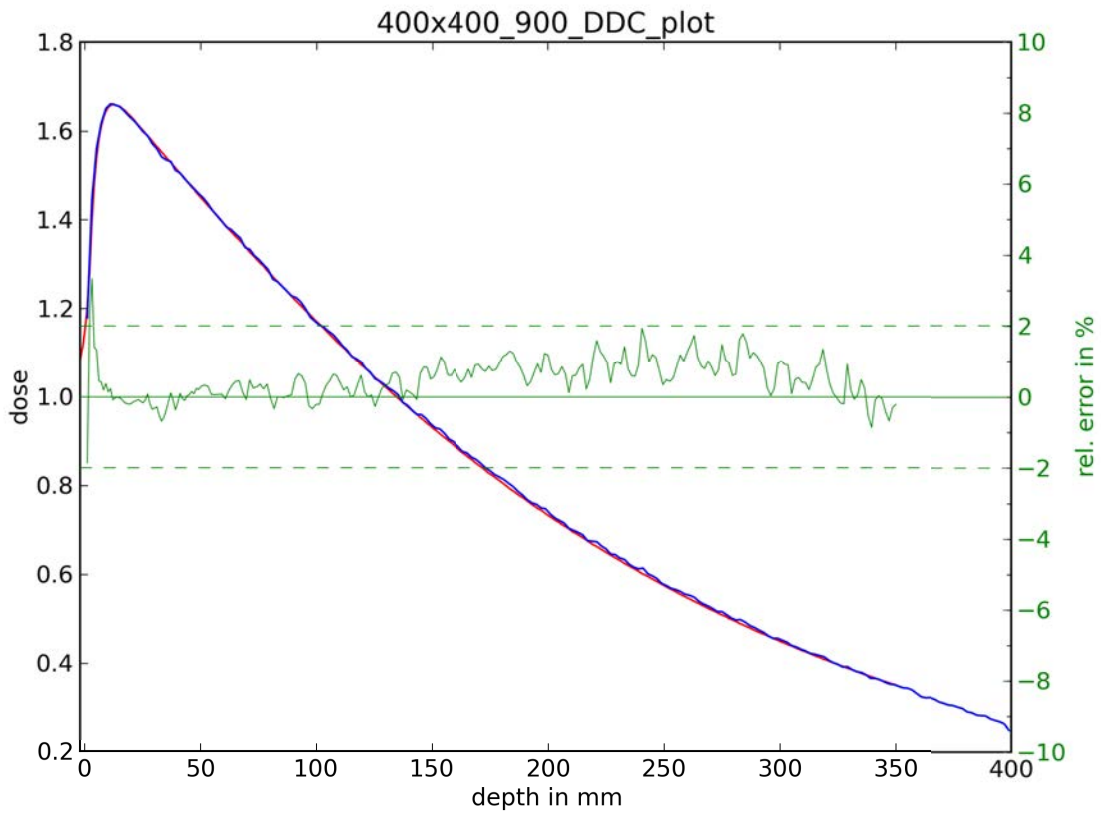
red: measurement; blue: simulation; green: rel. error

Depth Dose: field size 300x300 mm (PTW 31010 Semiflex)



red: measurement; blue: simulation; green: rel. error

Depth Dose: field size 400x400 mm (PTW 31010 Semiflex)



red: measurement; blue: simulation; green: rel. error



## Profiles

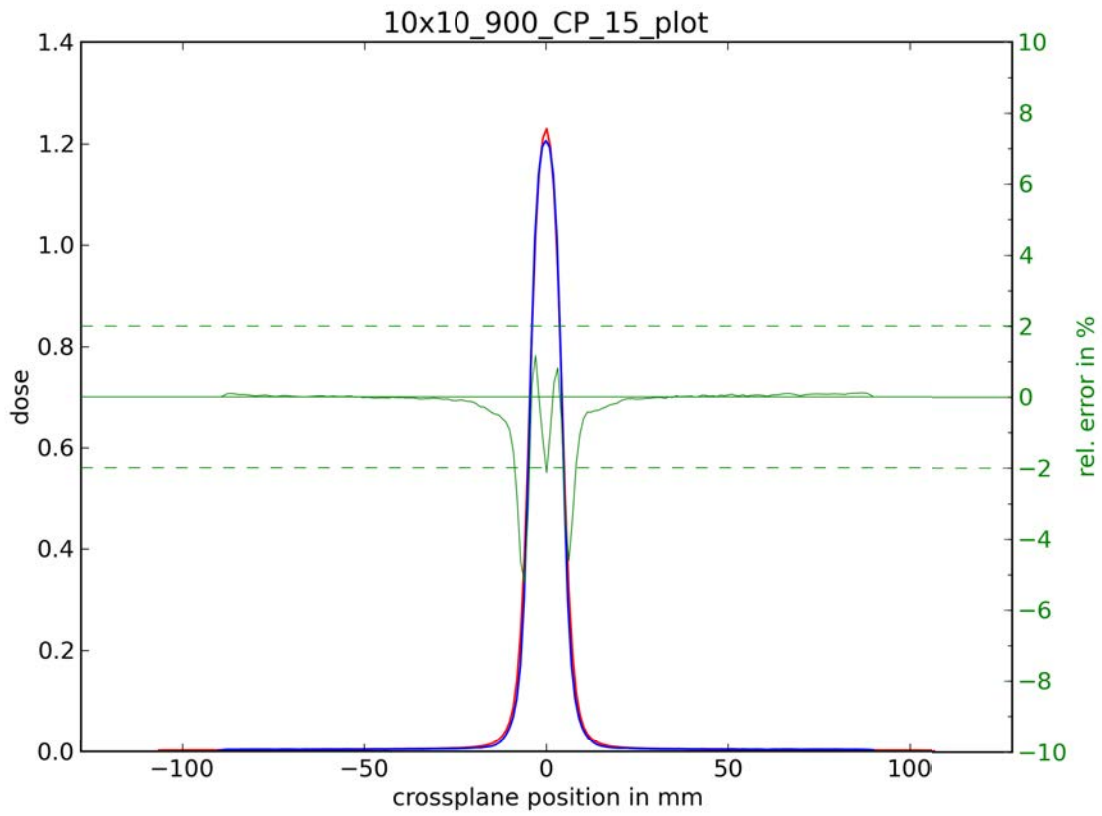
Comment for cross profiles:

A wrong field size setting was used for the 40mmx40mm INPLANE-measurement (measured profiles too wide).

Comment for diagonal profiles:

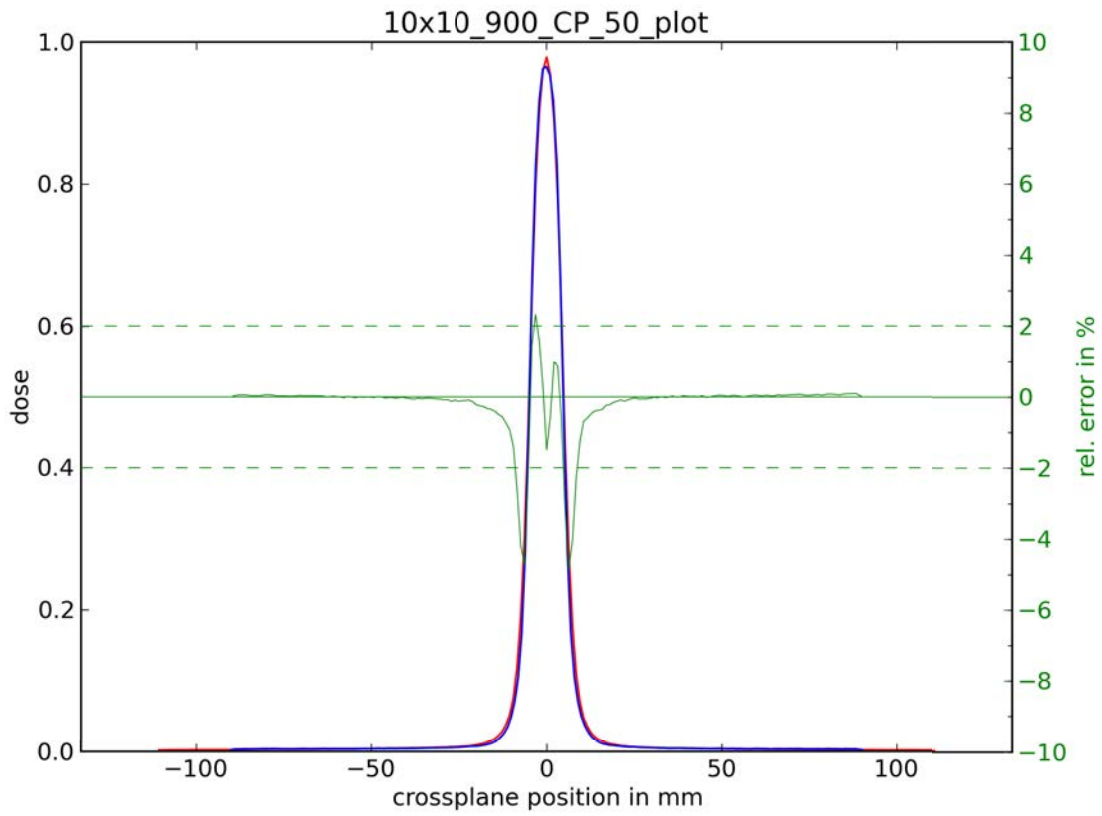
-no comment-

**CROSSPLANE-Profiles: field size 10x10 mm, depth 15 mm (PTW 60017 Diode E)**



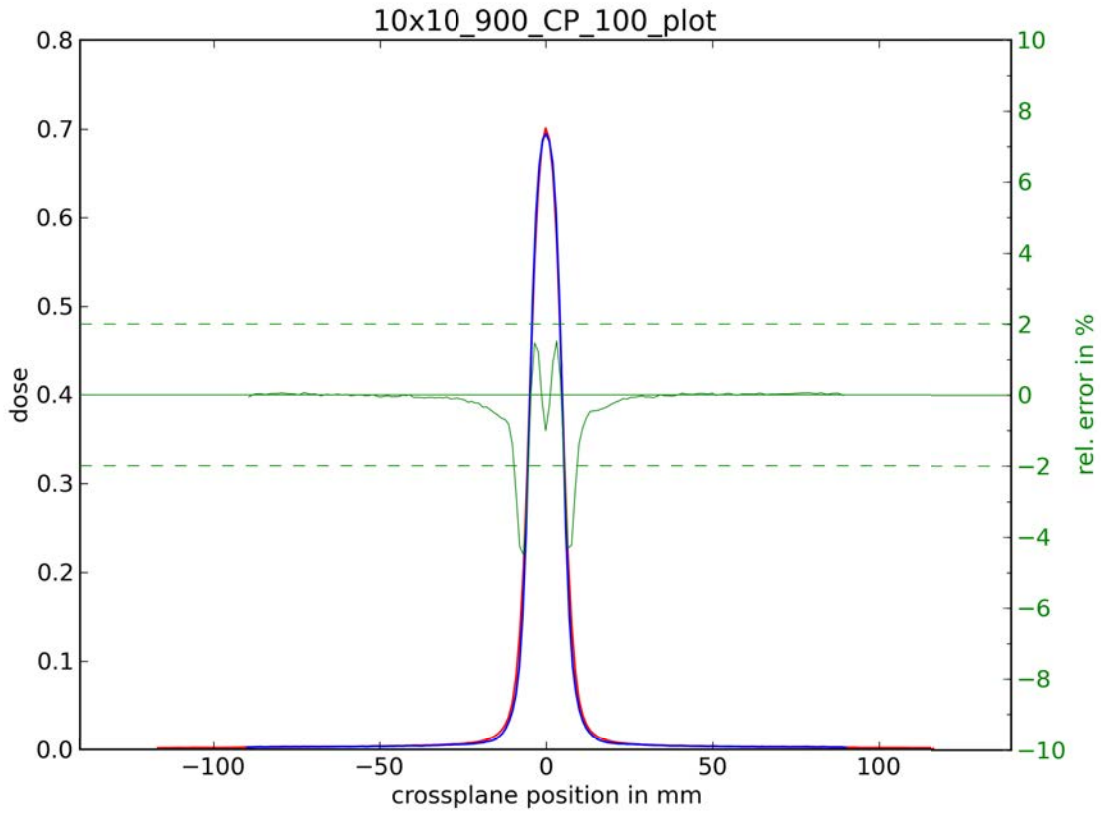
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 10x10 mm, depth 50 mm (PTW 60017 Diode E)**



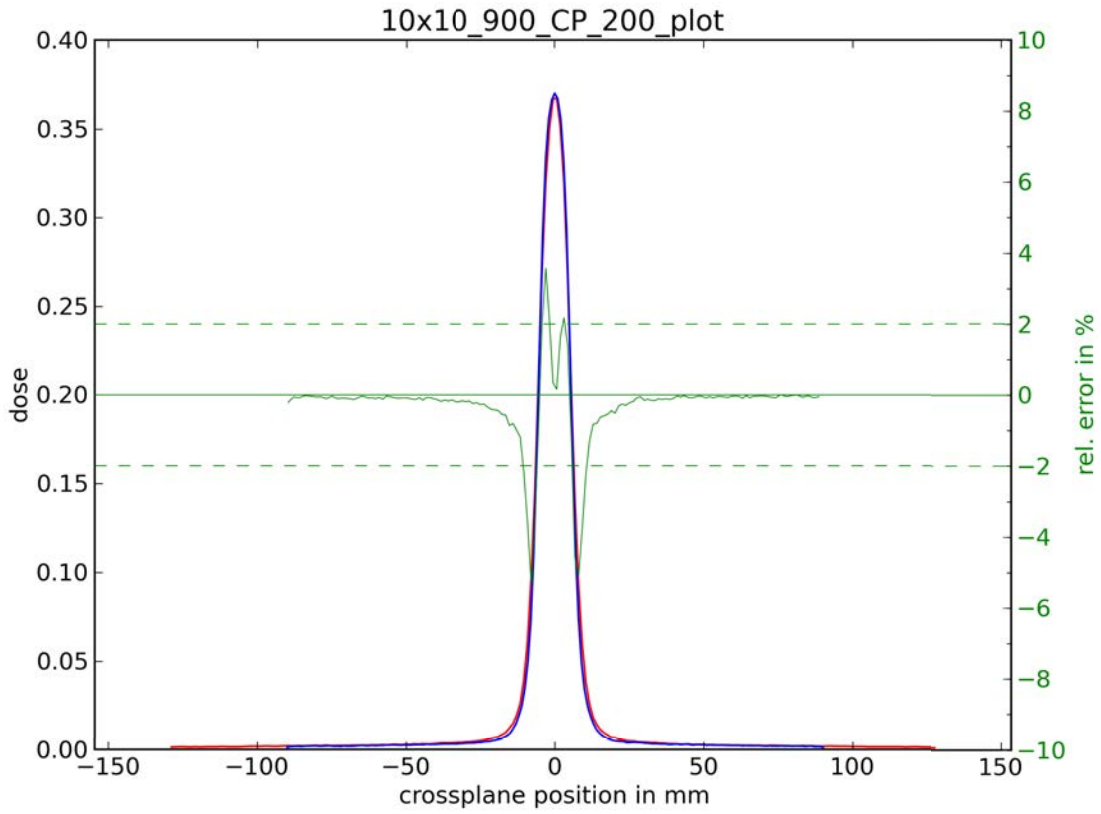
red: measurement; blue: simulation; green: rel. error

CROSSPLANE-Profiles: field size 10x10 mm, depth 100 mm (PTW 60017 Diode E)



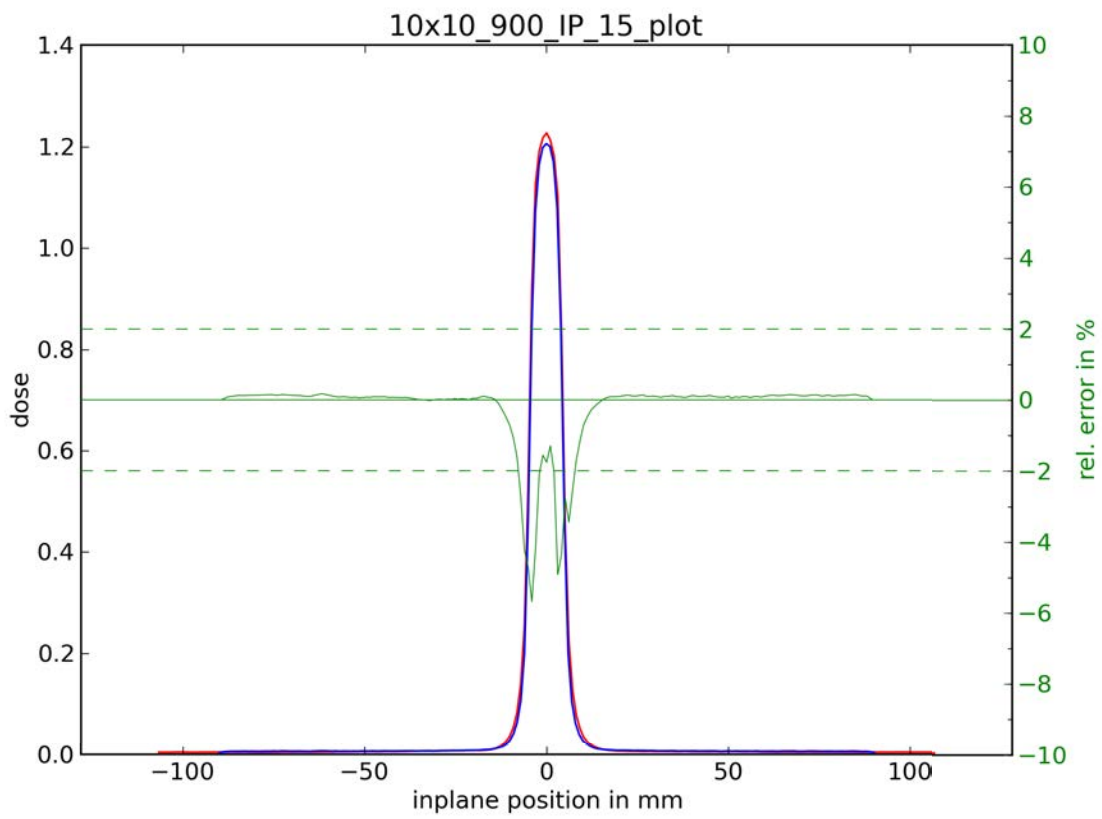
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 10x10 mm, depth 200 mm (PTW 60017 Diode E)**



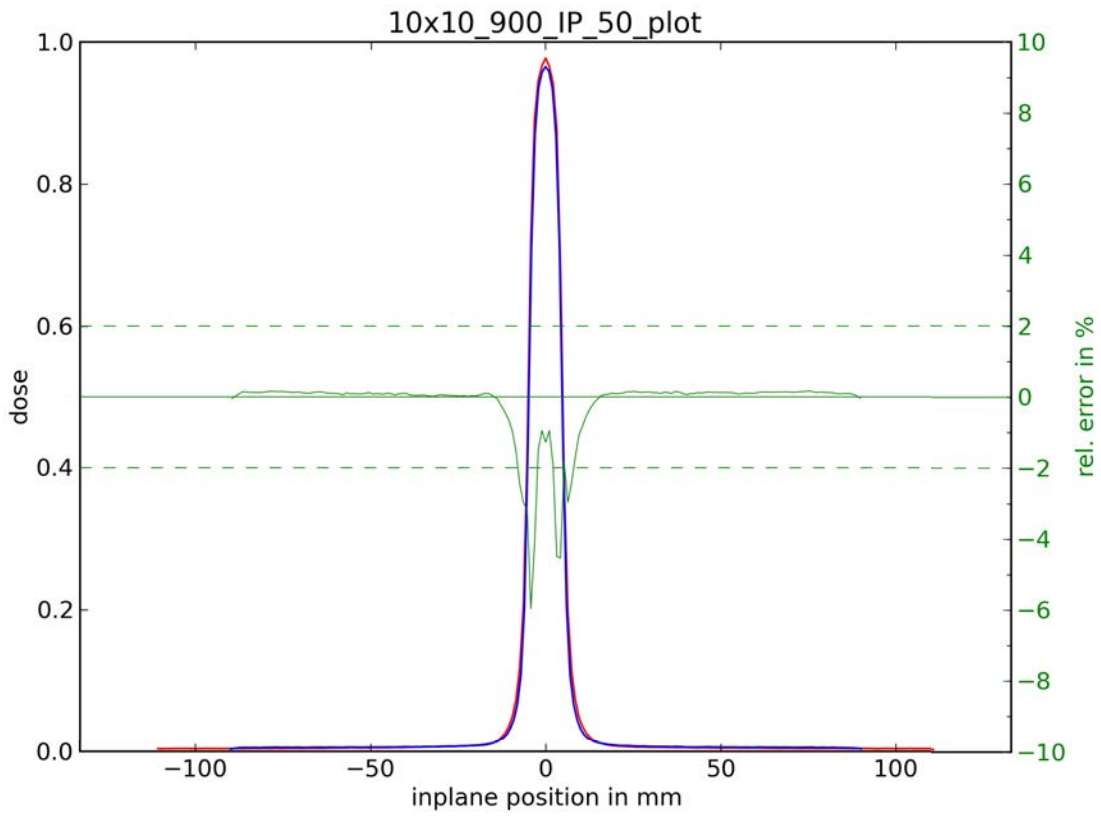
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 10x10 mm, depth 15 mm (PTW 60017 Diode E)**



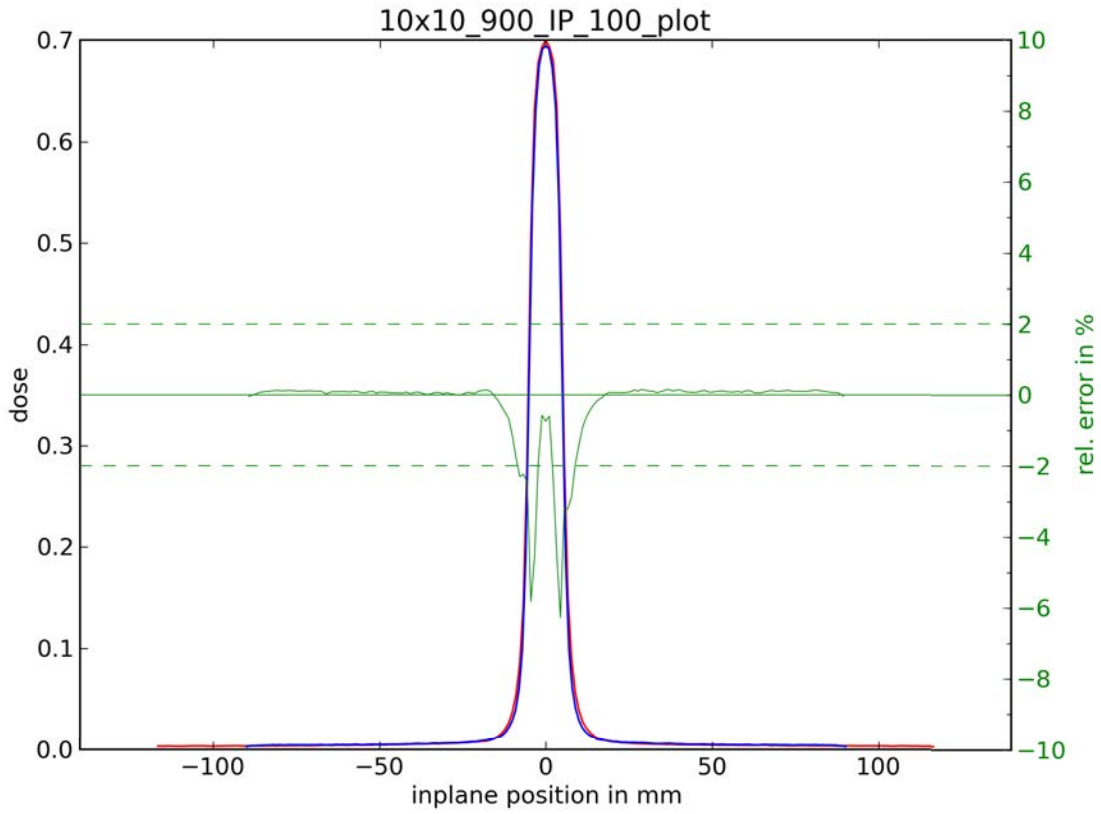
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 10x10 mm, depth 50 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

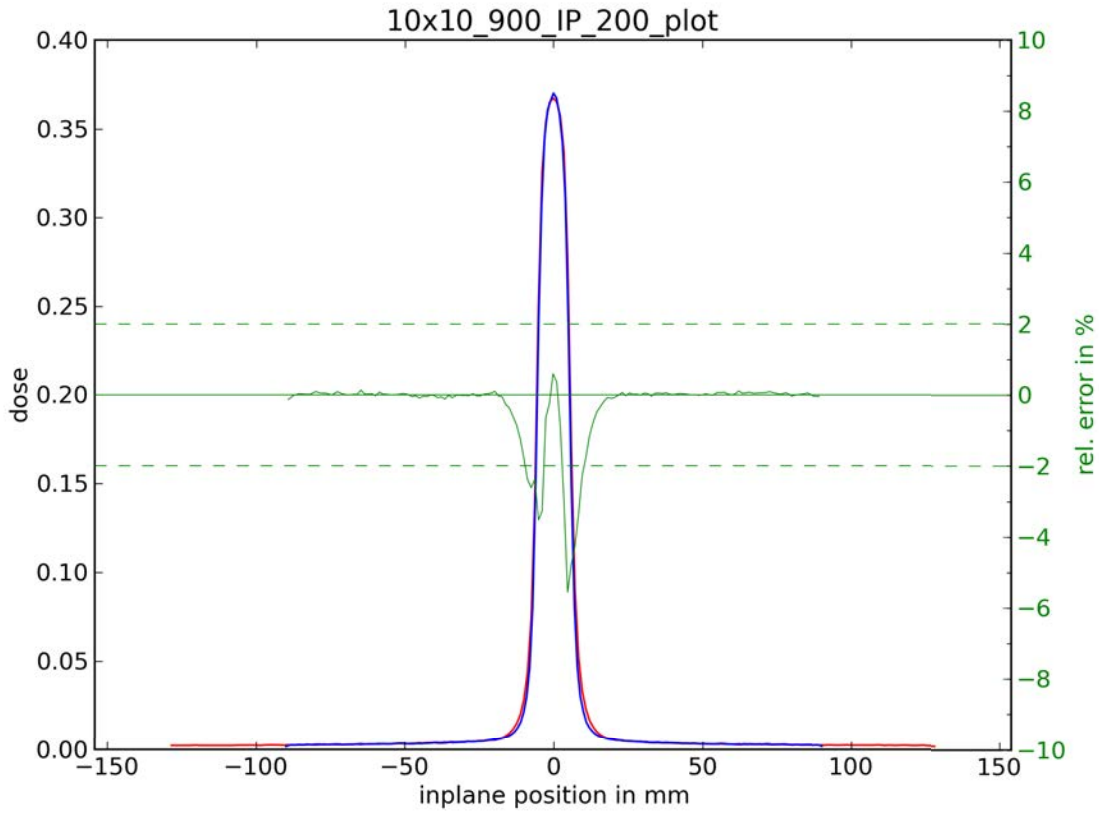
**INPLANE-Profiles: field size 10x10 mm, depth 100 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

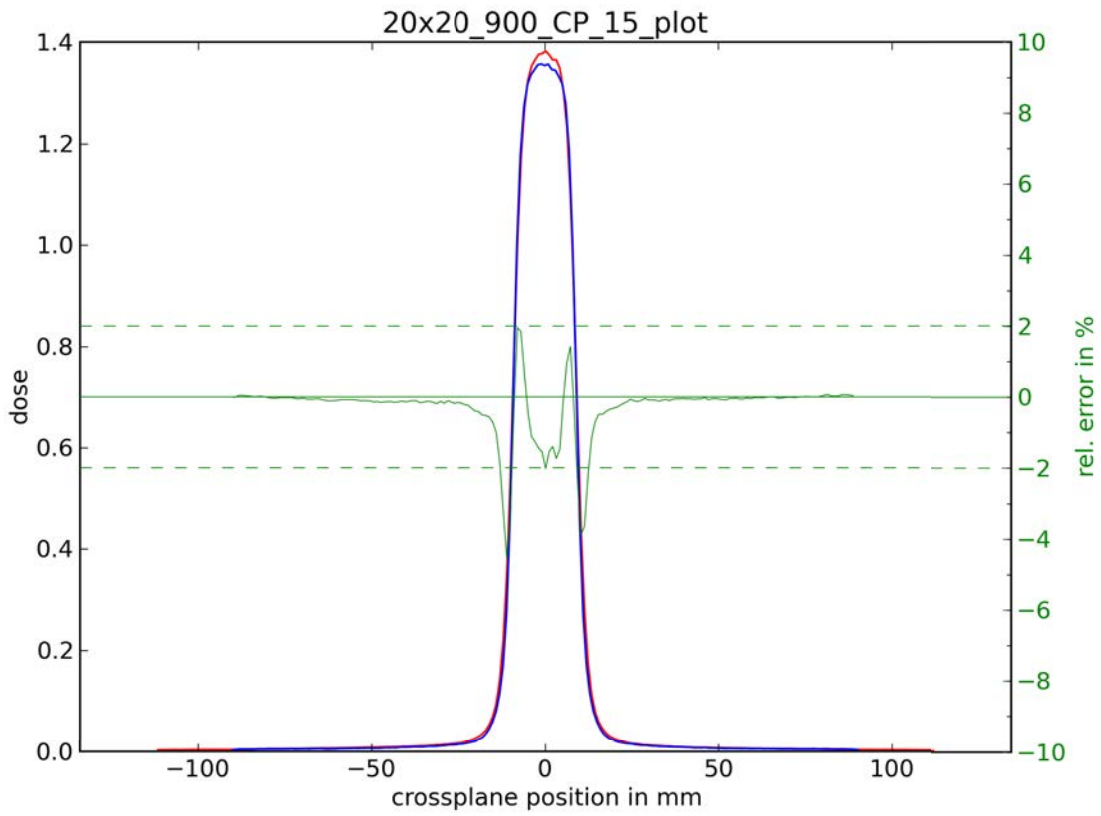


**INPLANE-Profiles: field size 10x10 mm, depth 200 mm (PTW 60017 Diode E)**



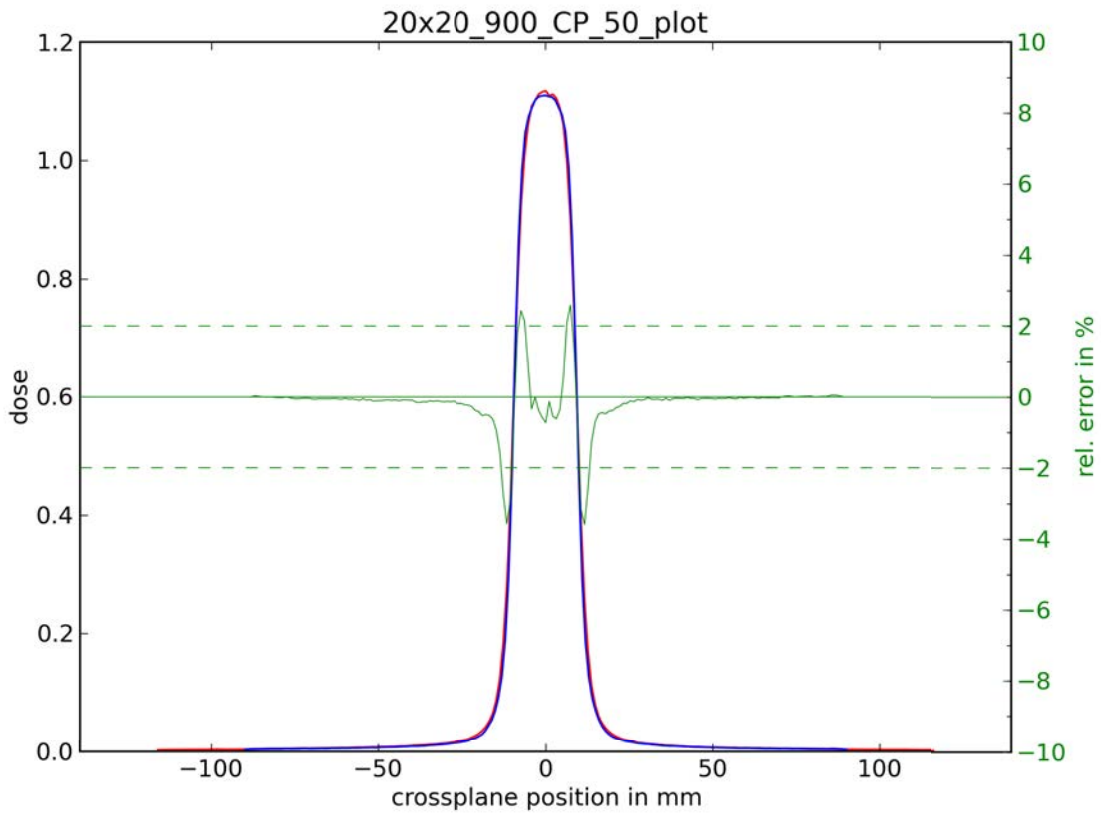
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 20x20 mm, depth 15 mm (PTW 60017 Diode E)**



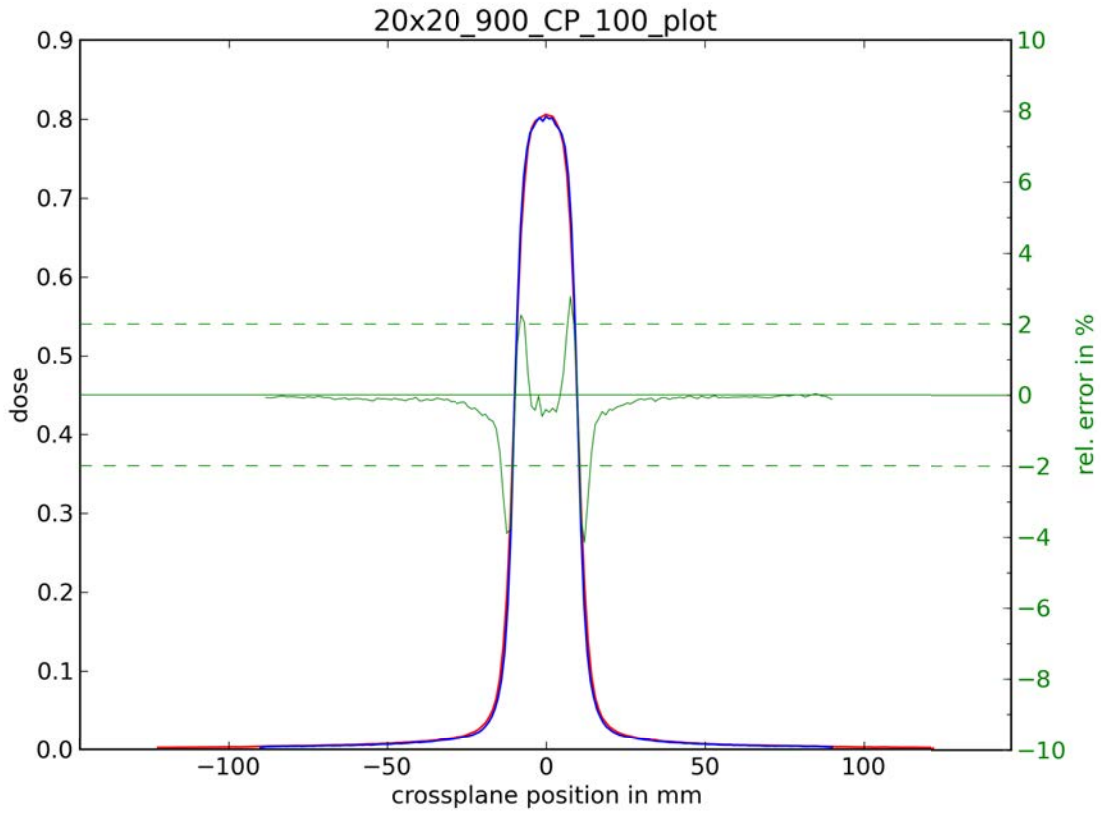
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 20x20 mm, depth 50 mm (PTW 60017 Diode E)**



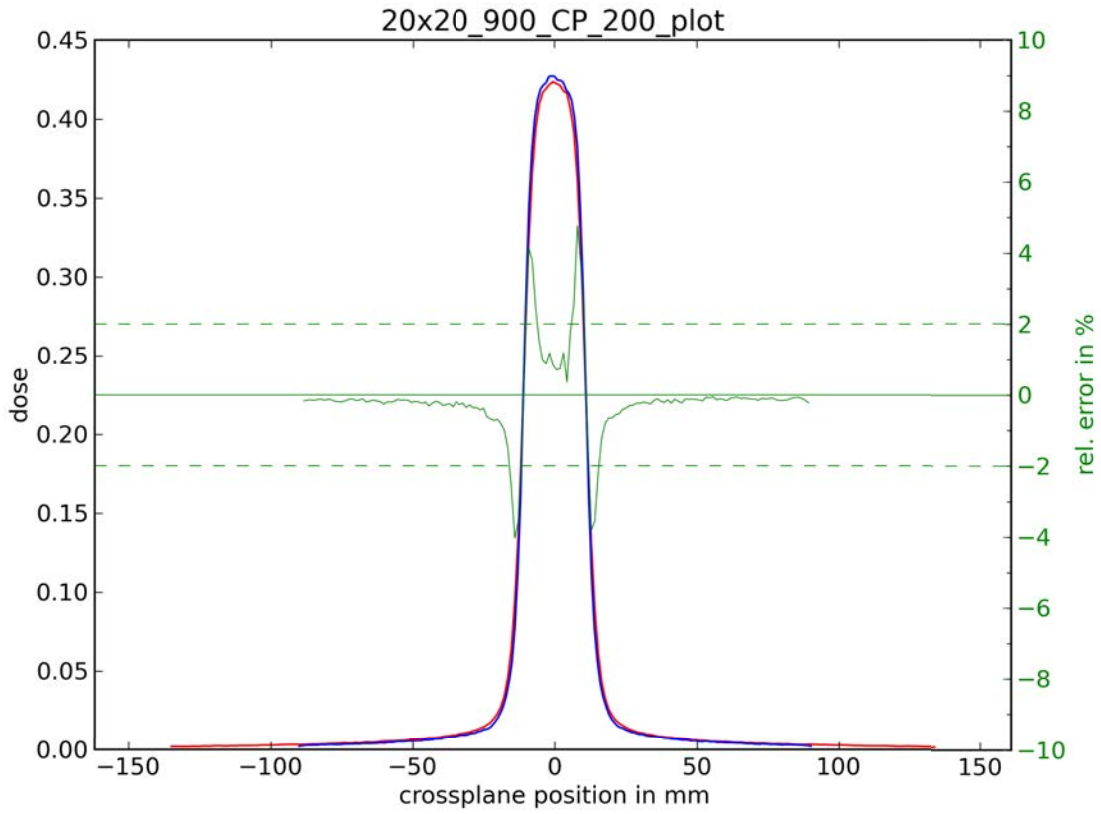
red: measurement; blue: simulation; green: rel. error

CROSSPLANE-Profiles: field size 20x20 mm, depth 100 mm (PTW 60017 Diode E)



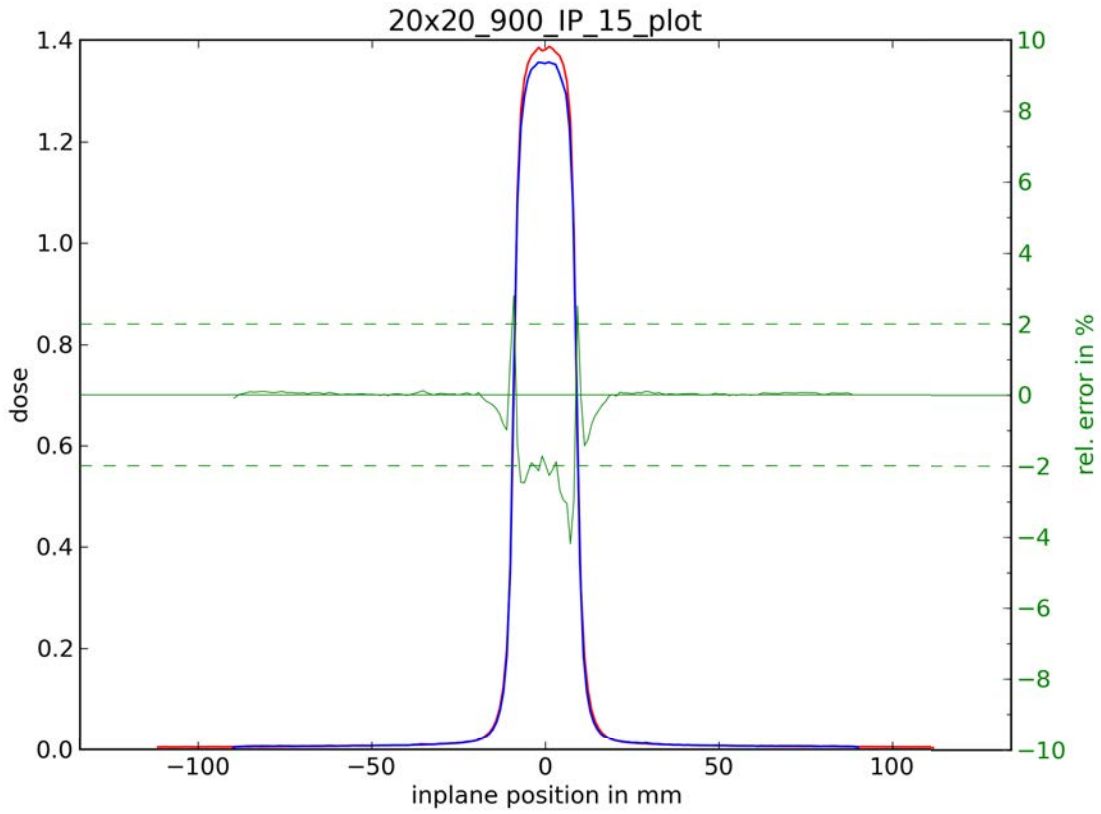
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 20x20 mm, depth 200 mm (PTW 60017 Diode E)**



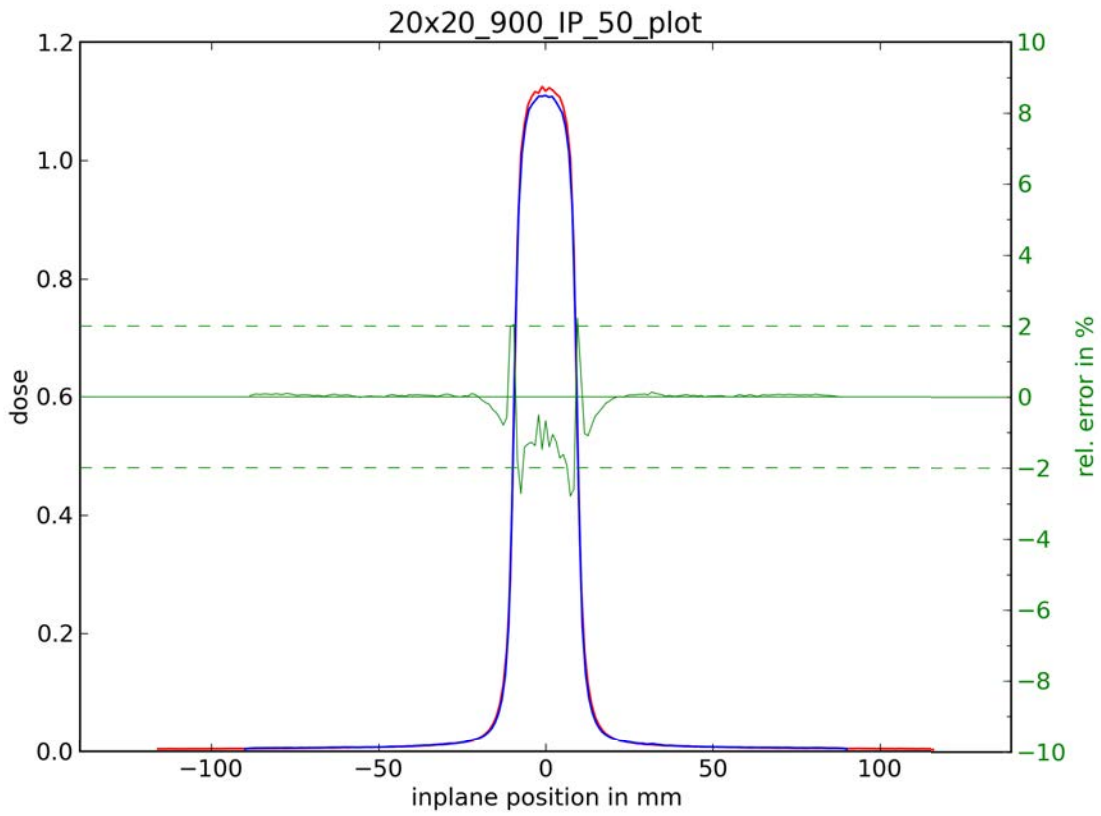
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 20x20 mm, depth 15 mm (PTW 60017 Diode E)**



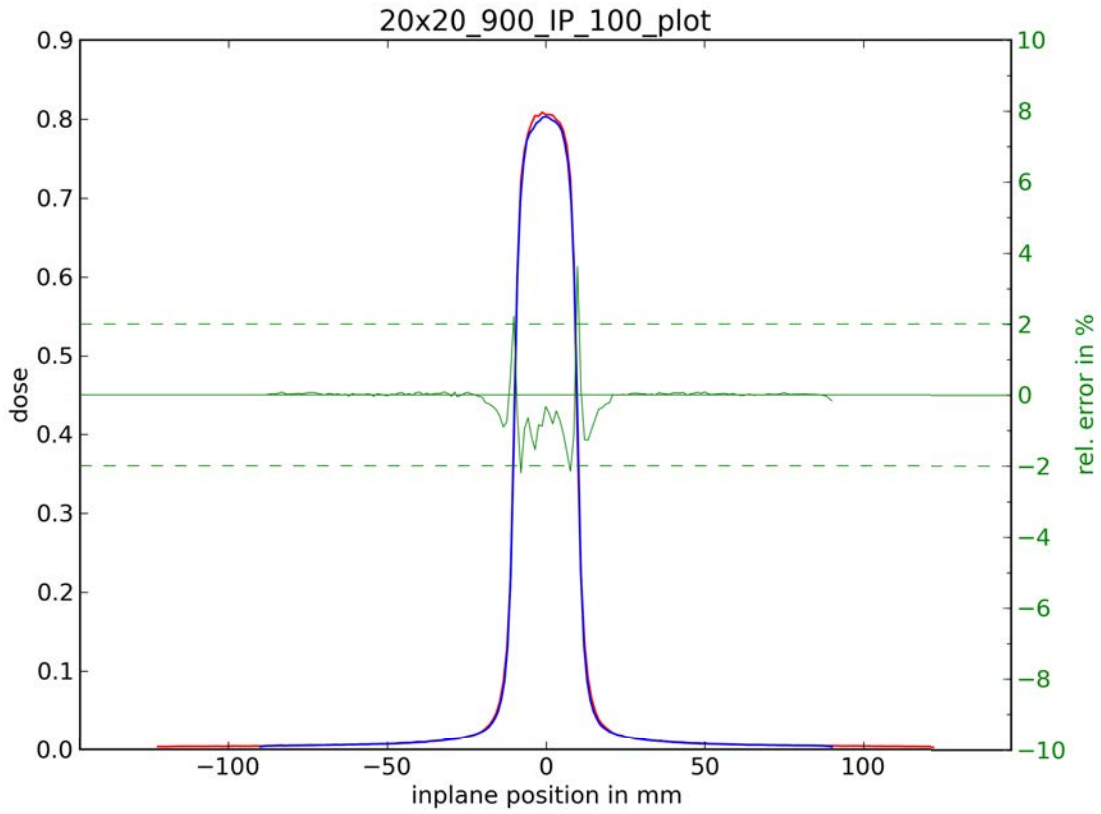
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 20x20 mm, depth 50 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

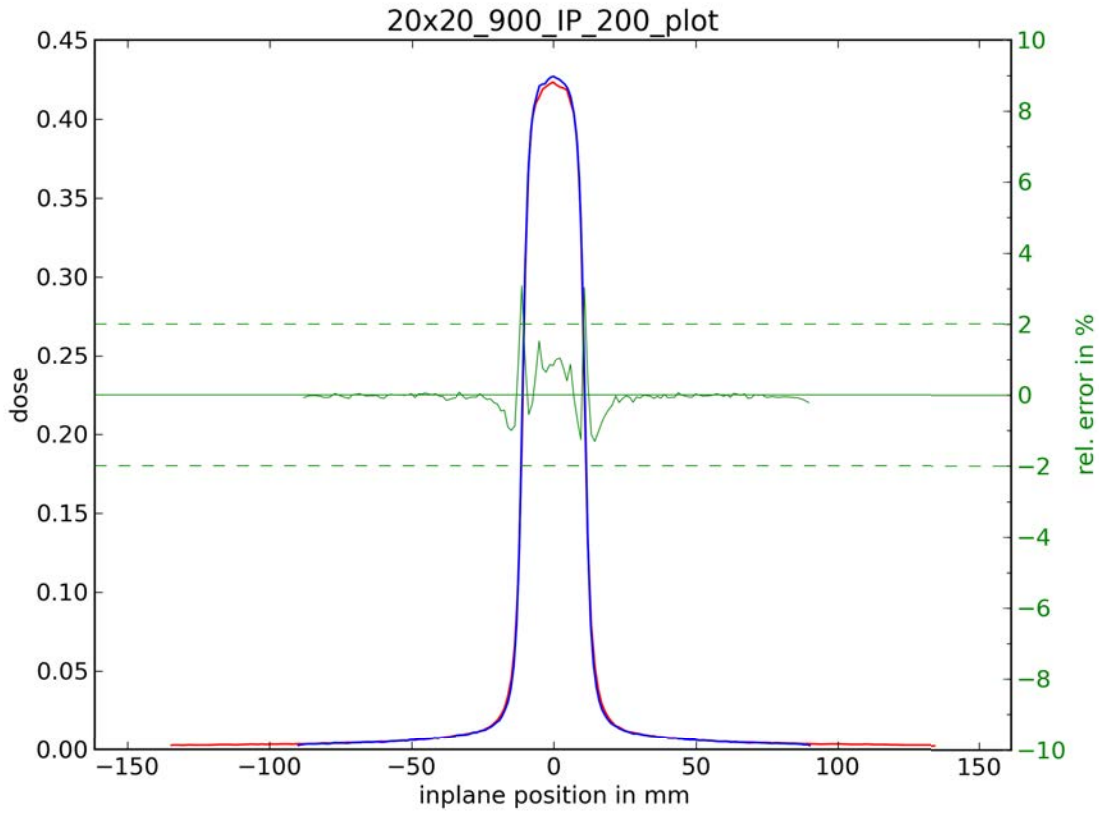
**INPLANE-Profiles: field size 20x20 mm, depth 100 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

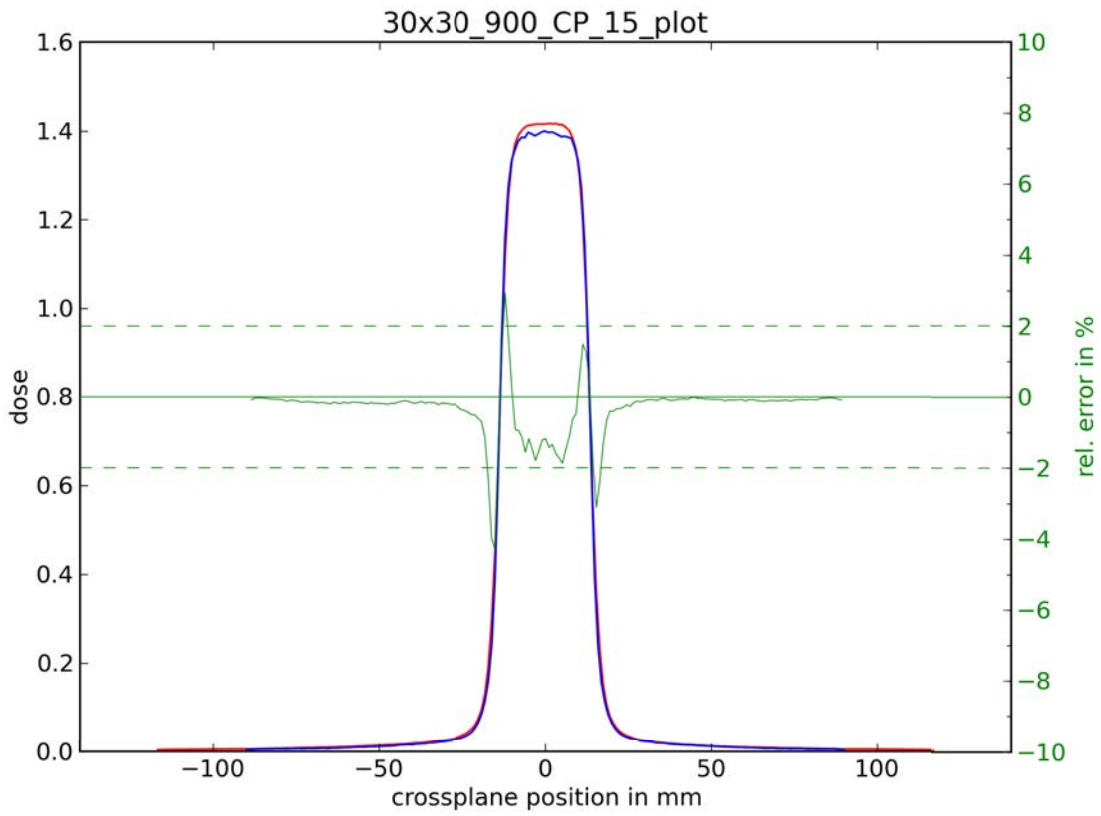


**INPLANE-Profiles: field size 20x20 mm, depth 200 mm (PTW 60017 Diode E)**



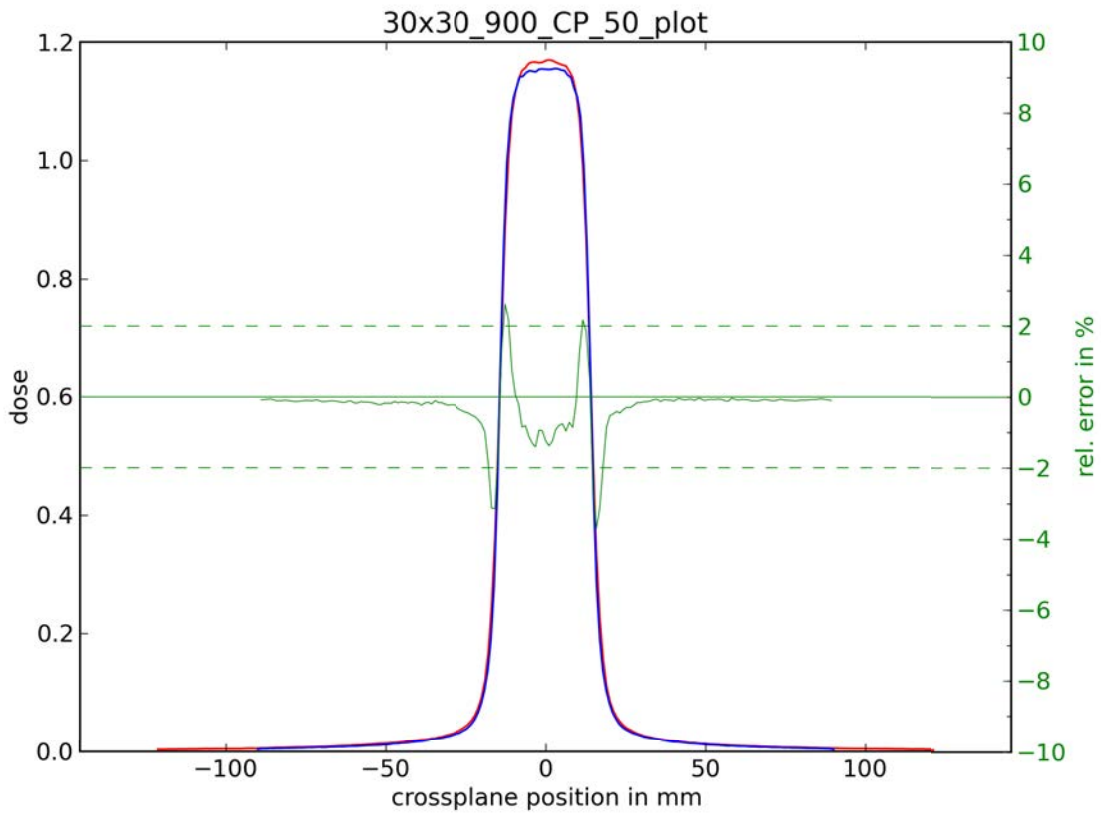
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 30x30 mm, depth 15 mm (PTW 60017 Diode E)**



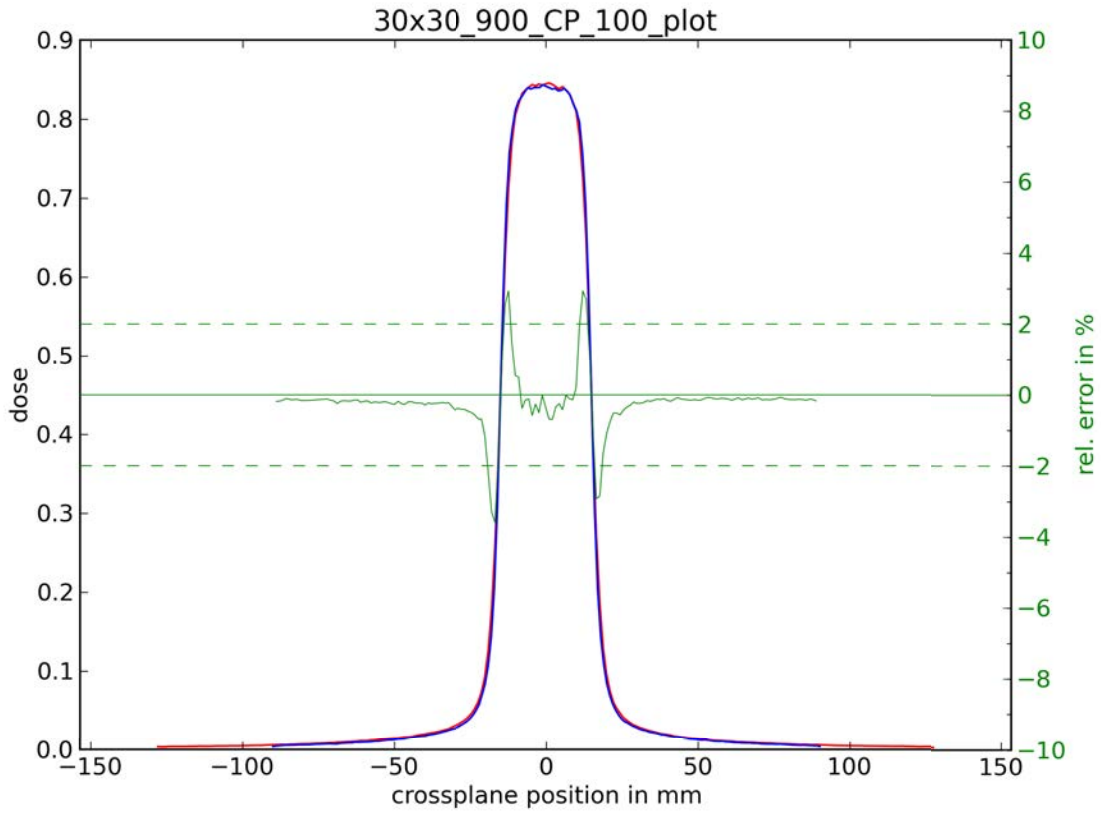
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 30x30 mm, depth 50 mm (PTW 60017 Diode E)**



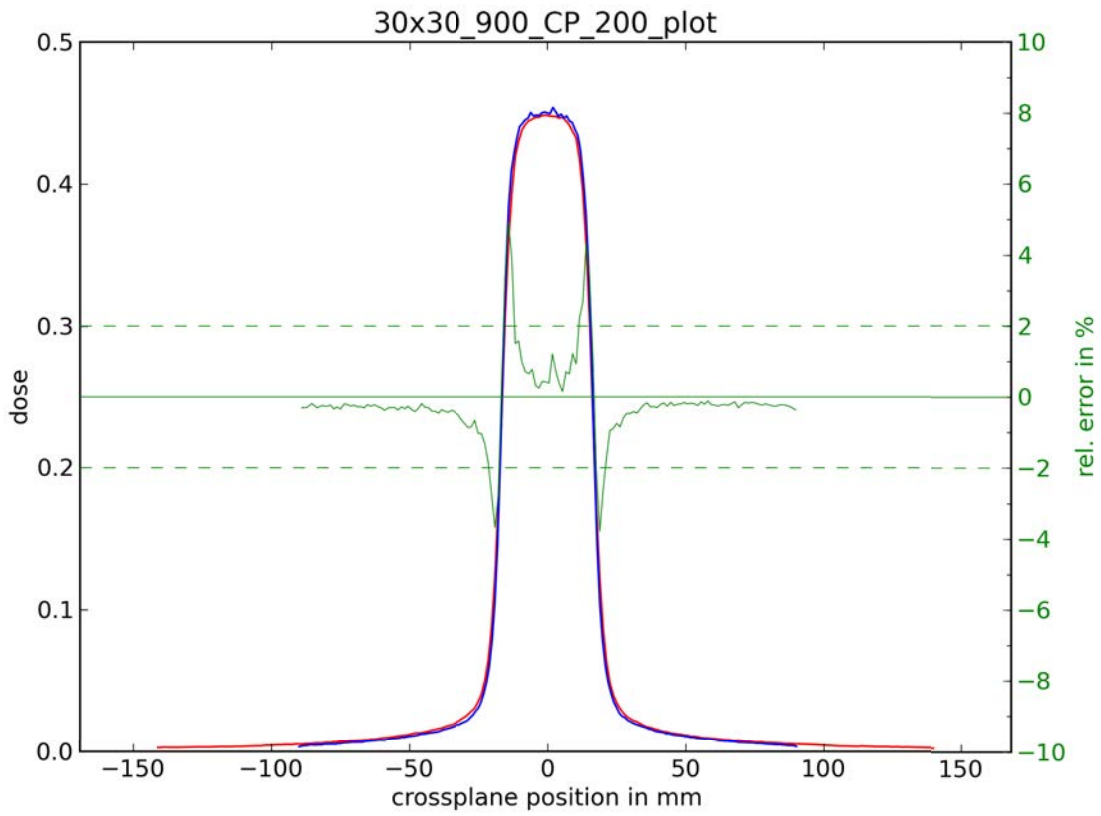
red: measurement; blue: simulation; green: rel. error

CROSSPLANE-Profiles: field size 30x30 mm, depth 100 mm (PTW 60017 Diode E)



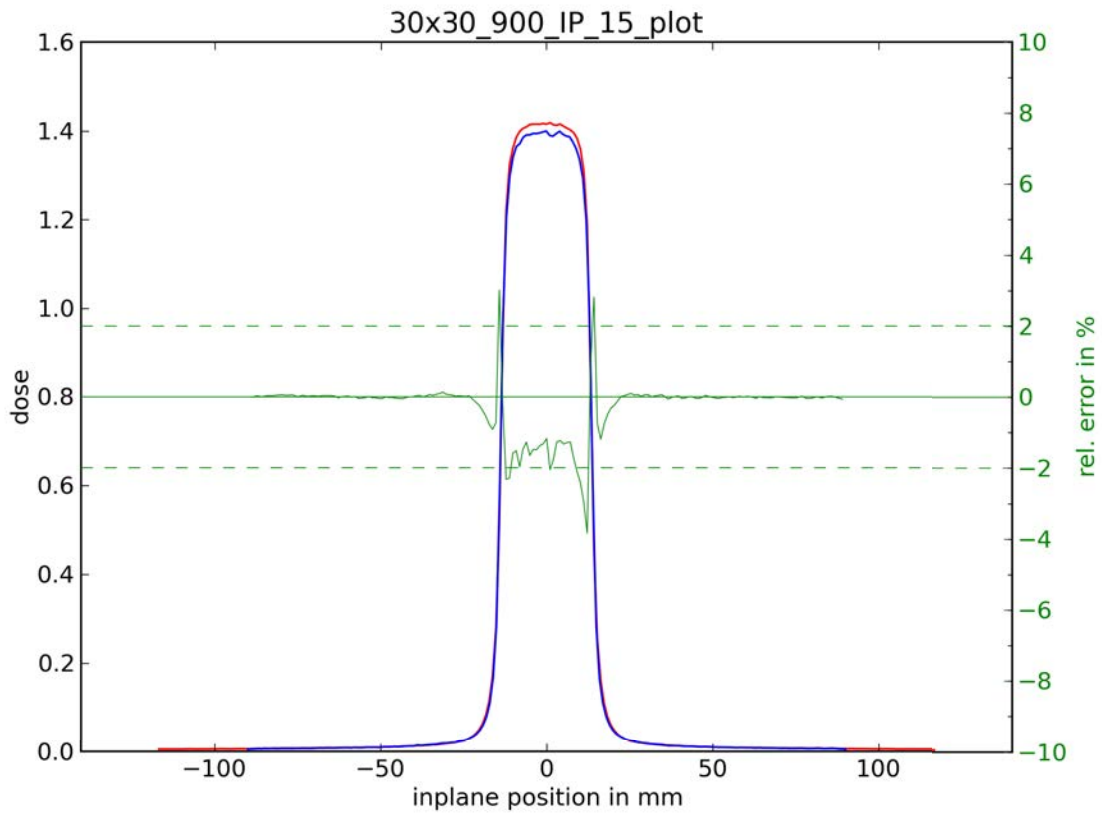
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 30x30 mm, depth 200 mm (PTW 60017 Diode E)**



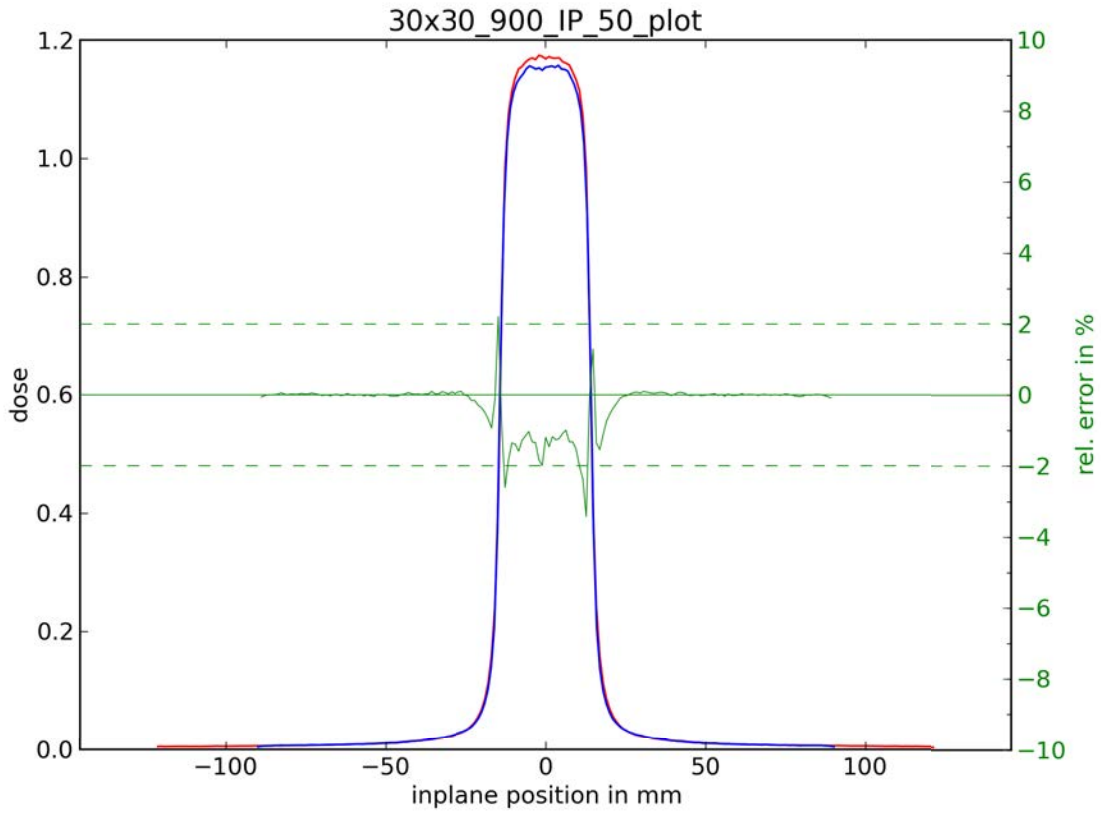
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 30x30 mm, depth 15 mm (PTW 60017 Diode E)**



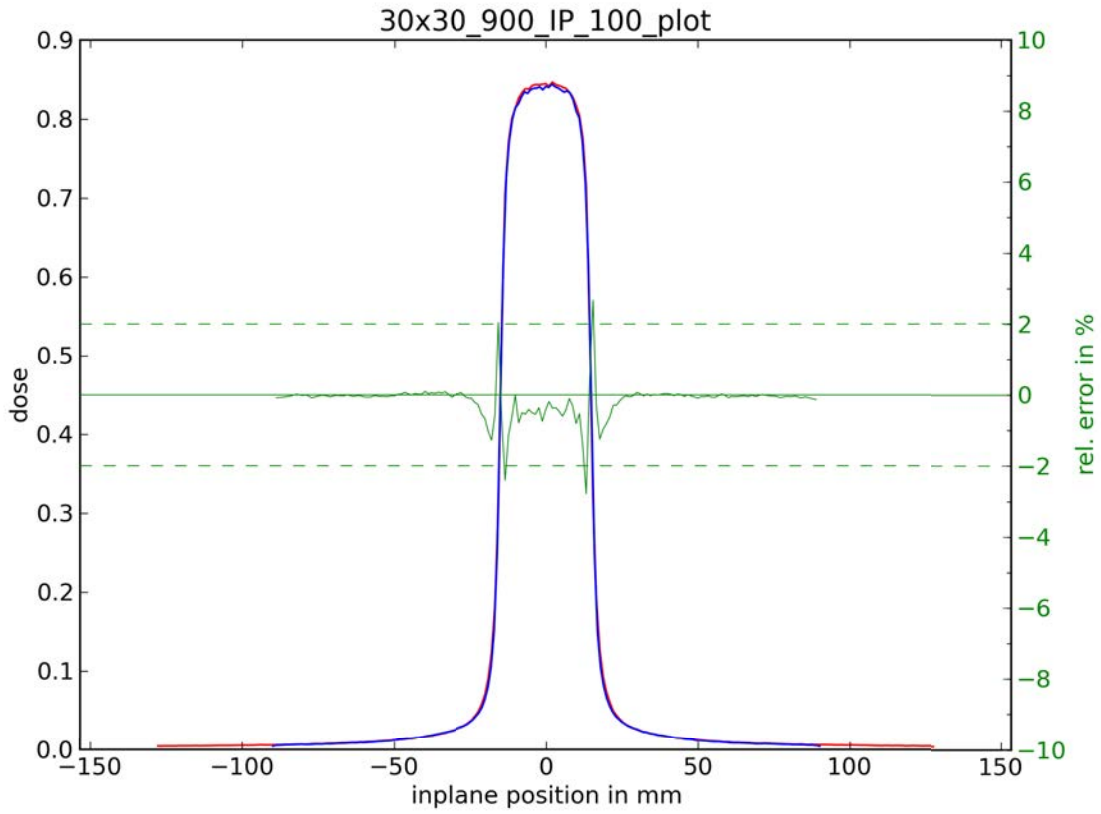
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 30x30 mm, depth 50 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

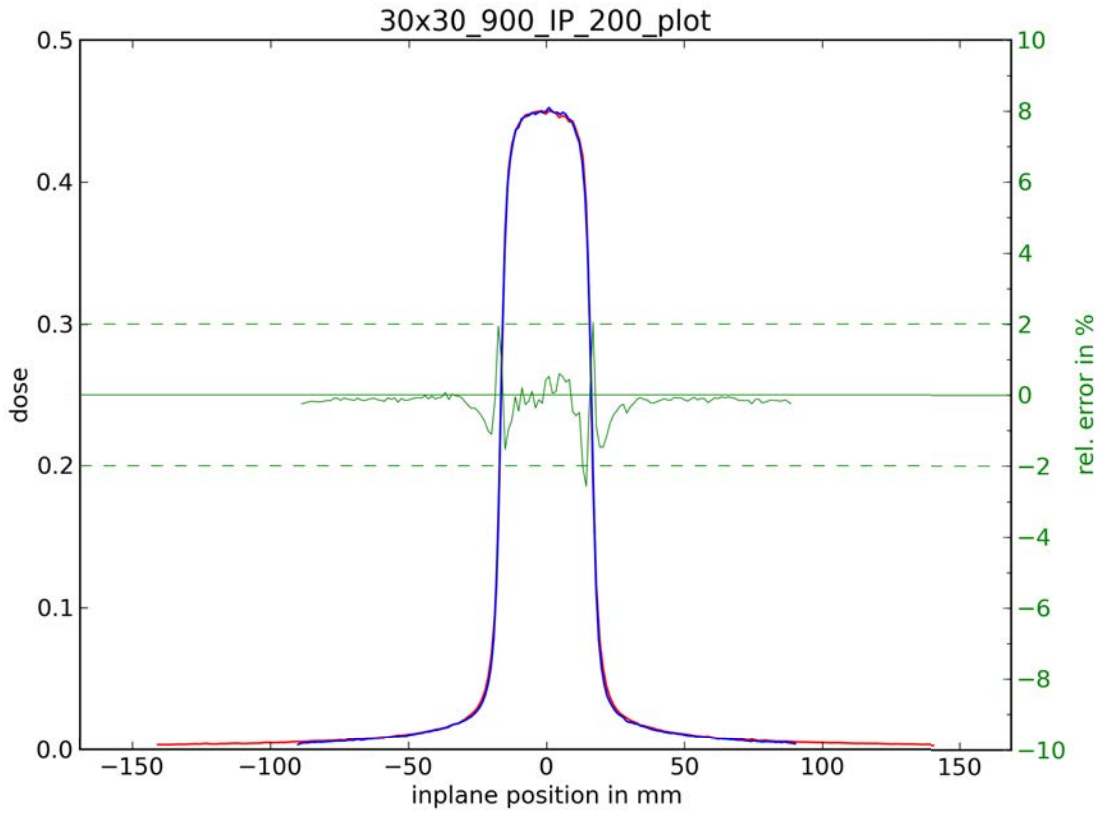
**INPLANE-Profiles: field size 30x30 mm, depth 100 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

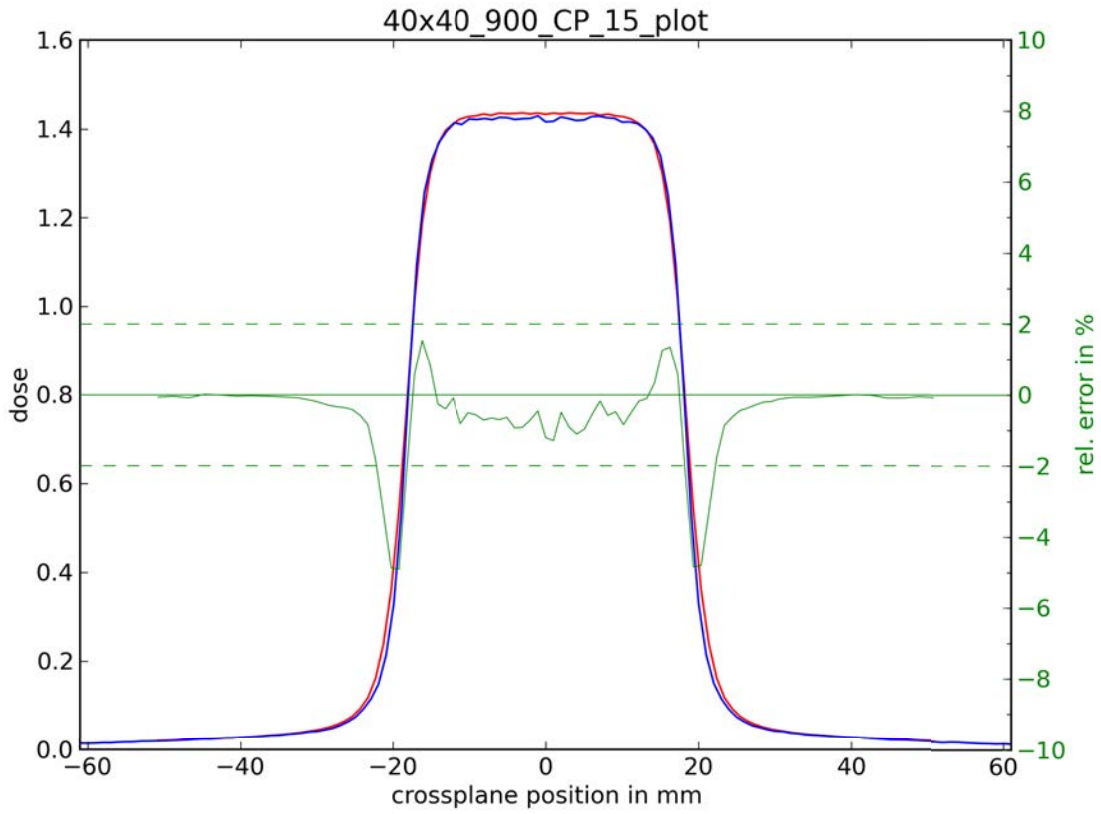


**INPLANE-Profiles: field size 30x30 mm, depth 200 mm (PTW 60017 Diode E)**



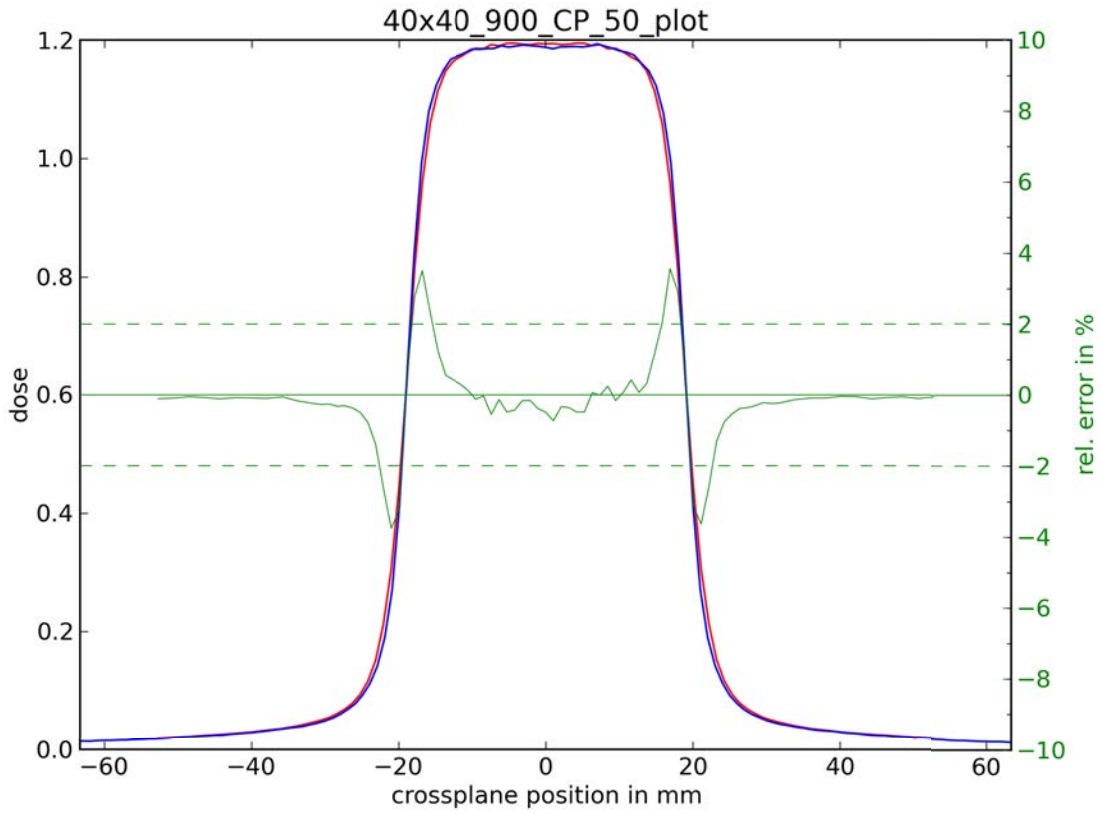
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 40x40 mm, depth 15 mm (PTW 60017 Diode E)**



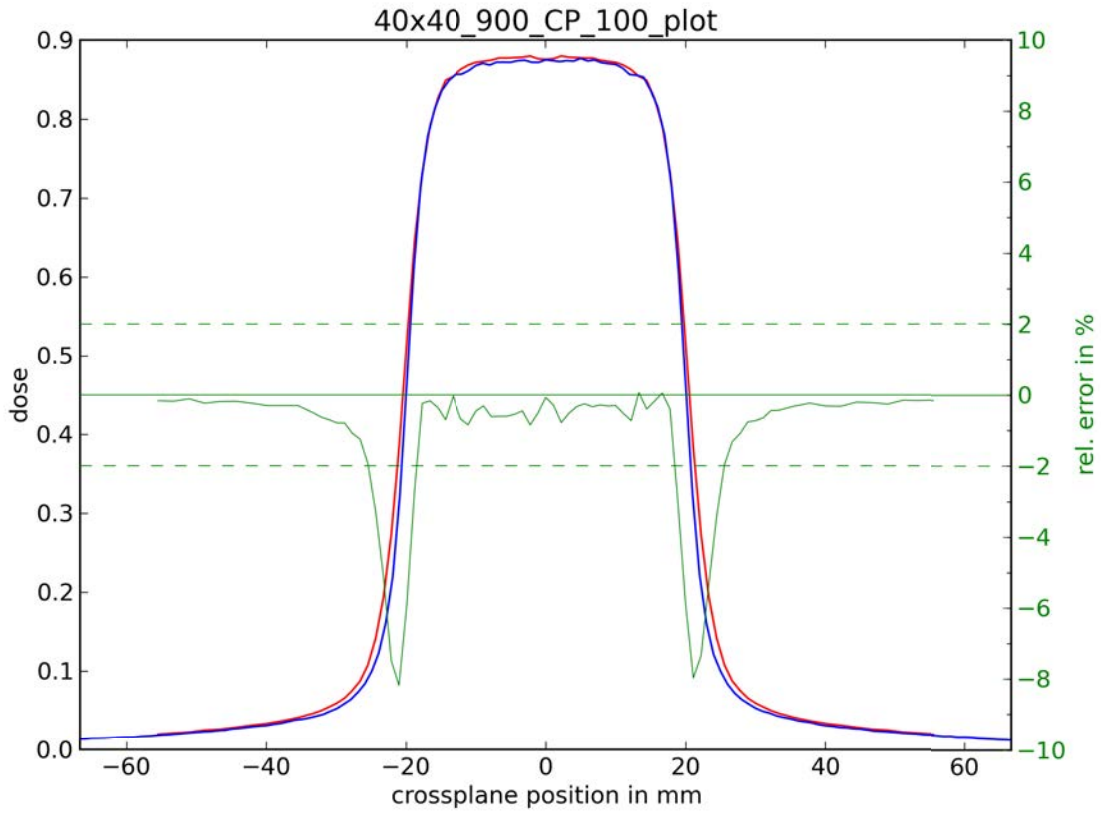
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 40x40 mm, depth 50 mm (PTW 60017 Diode E)**



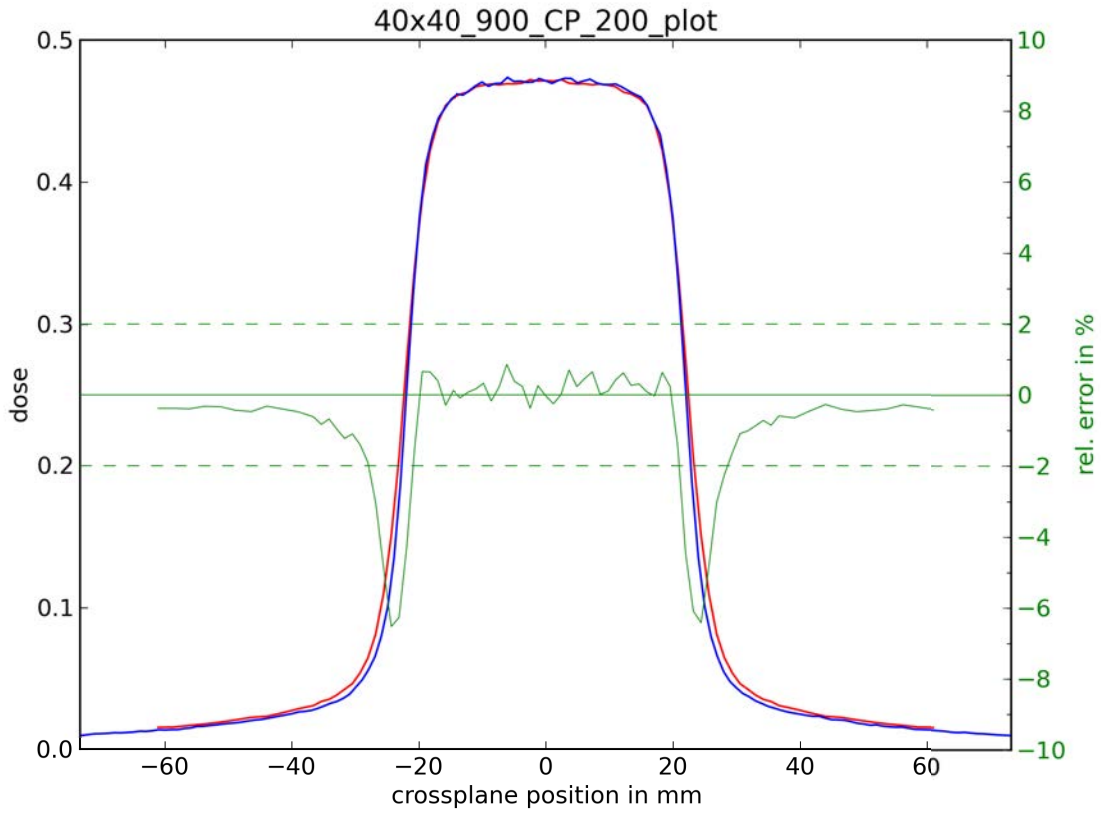
red: measurement; blue: simulation; green: rel. error

CROSSPLANE-Profiles: field size 40x40 mm, depth 100 mm (PTW 60017 Diode E)



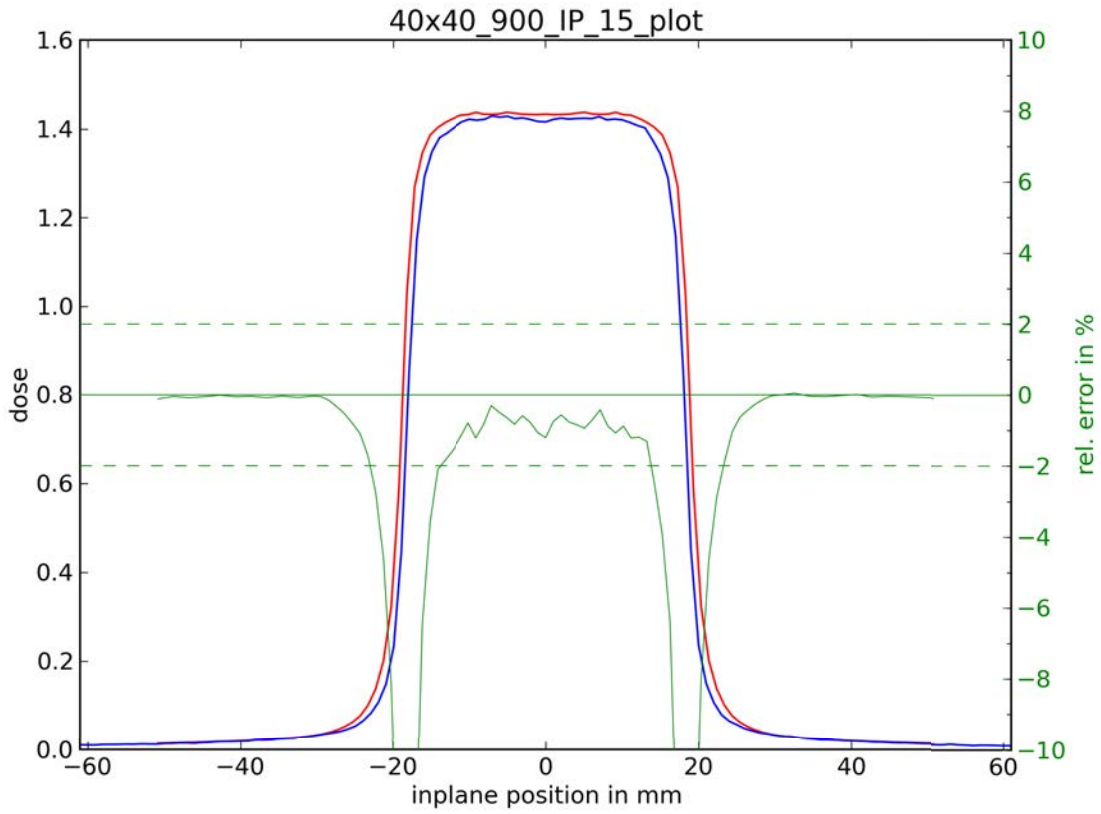
red: measurement; blue: simulation; green: rel. error

CROSSPLANE-Profiles: field size 40x40 mm, depth 200 mm (PTW 60017 Diode E)



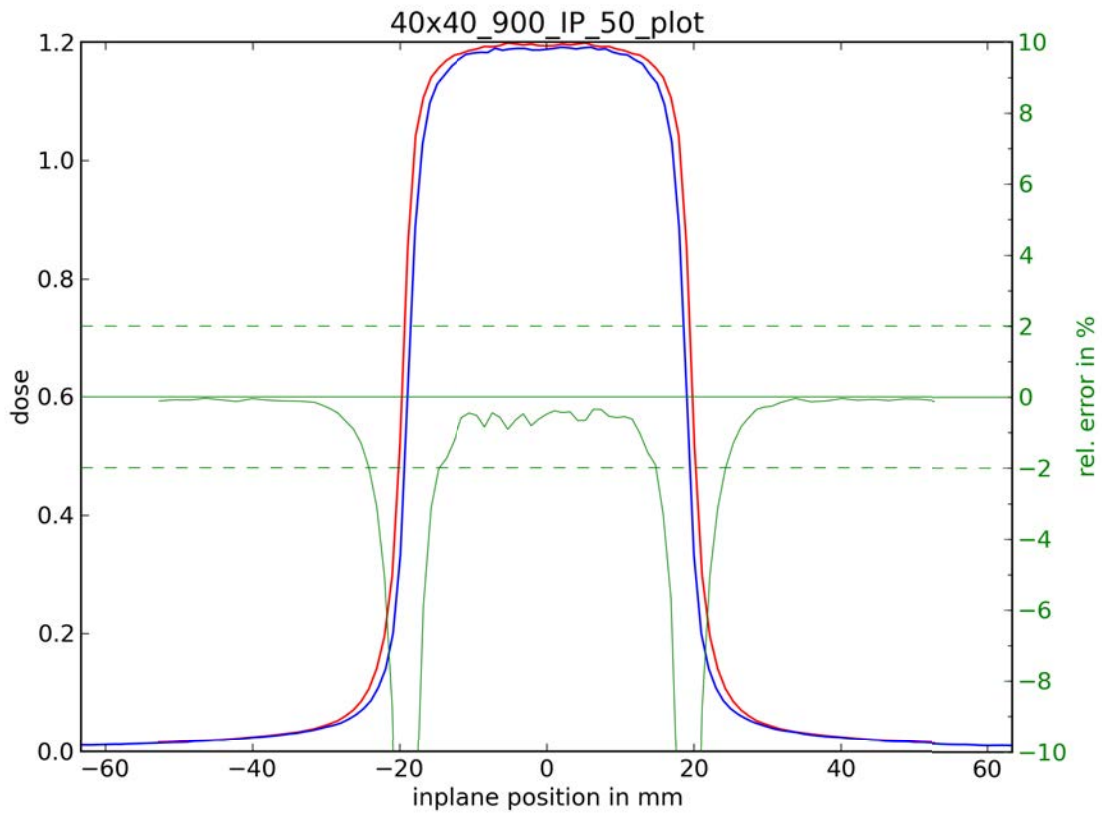
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 40x40 mm, depth 15 mm (PTW 60017 Diode E)**



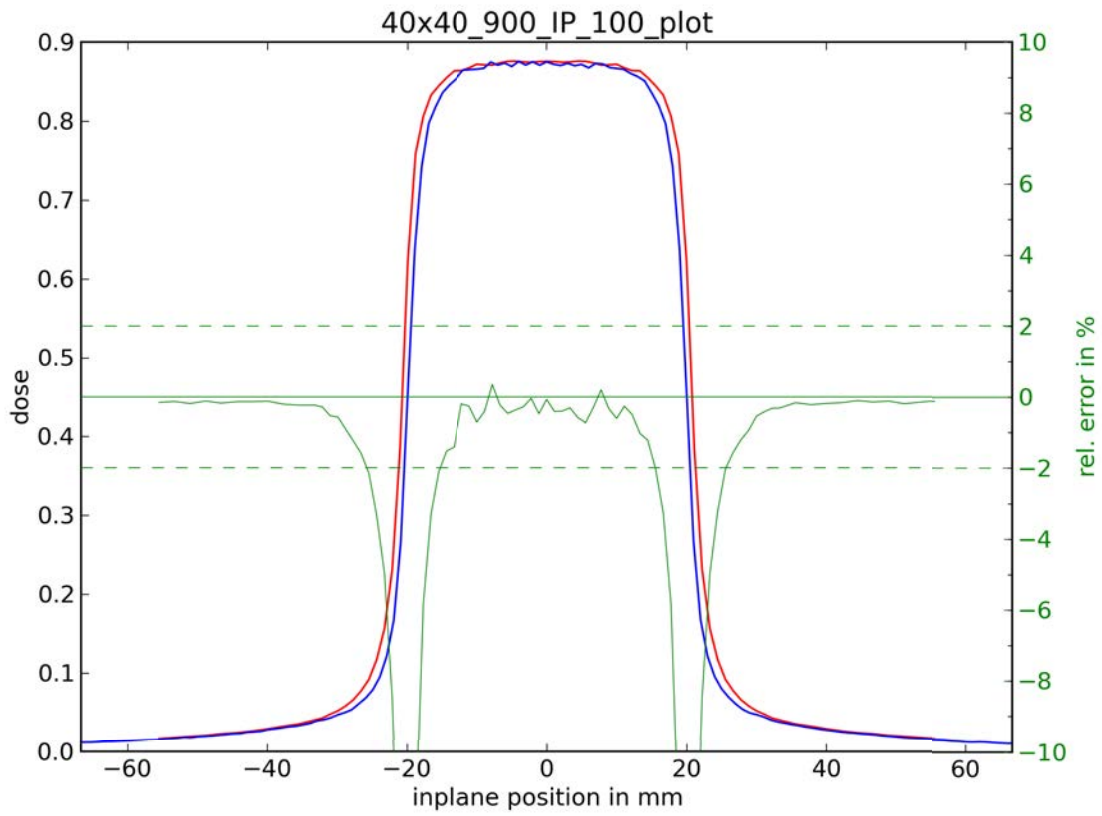
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 40x40 mm, depth 50 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

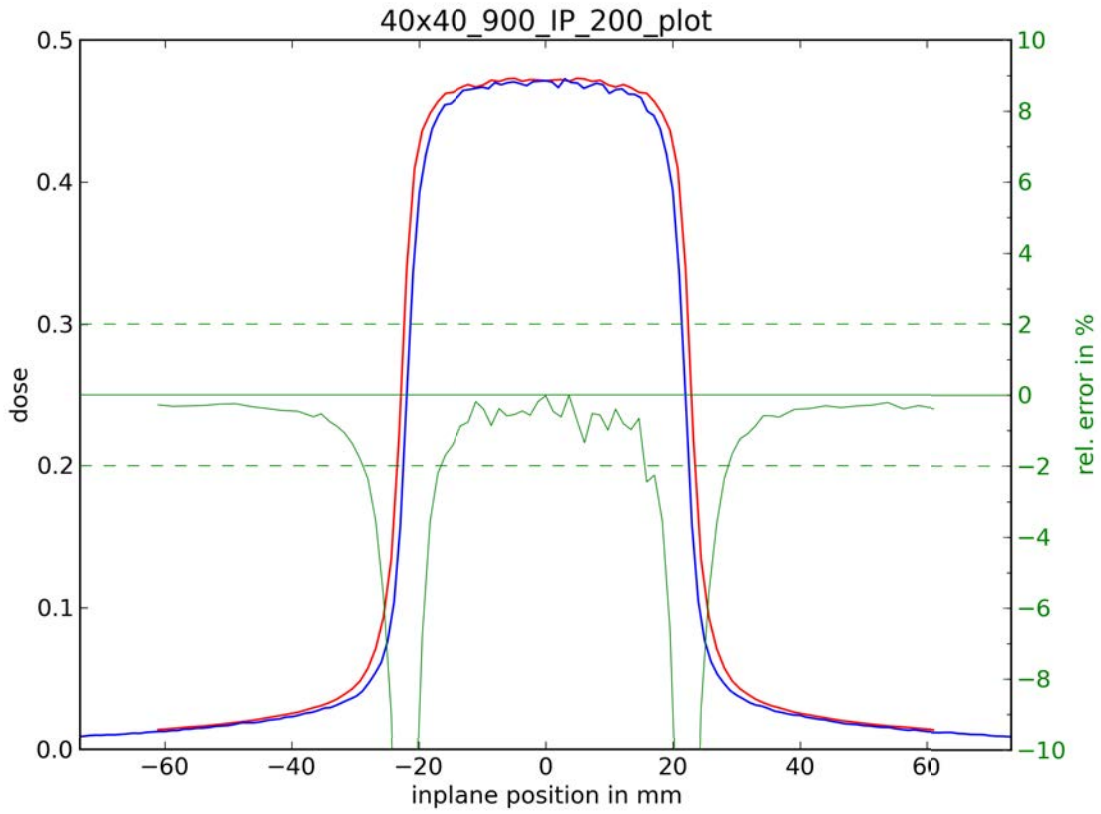
**INPLANE-Profiles: field size 40x40 mm, depth 100 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

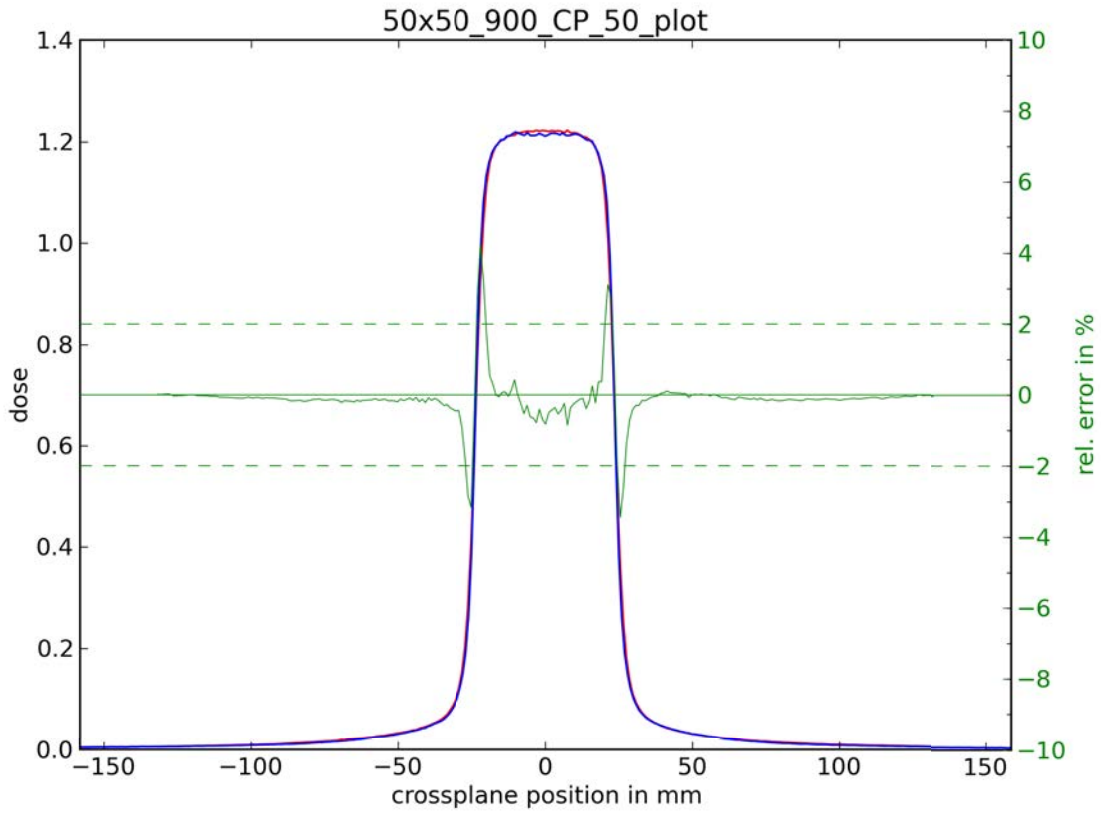


**INPLANE-Profiles: field size 40x40 mm, depth 200 mm (PTW 60017 Diode E)**



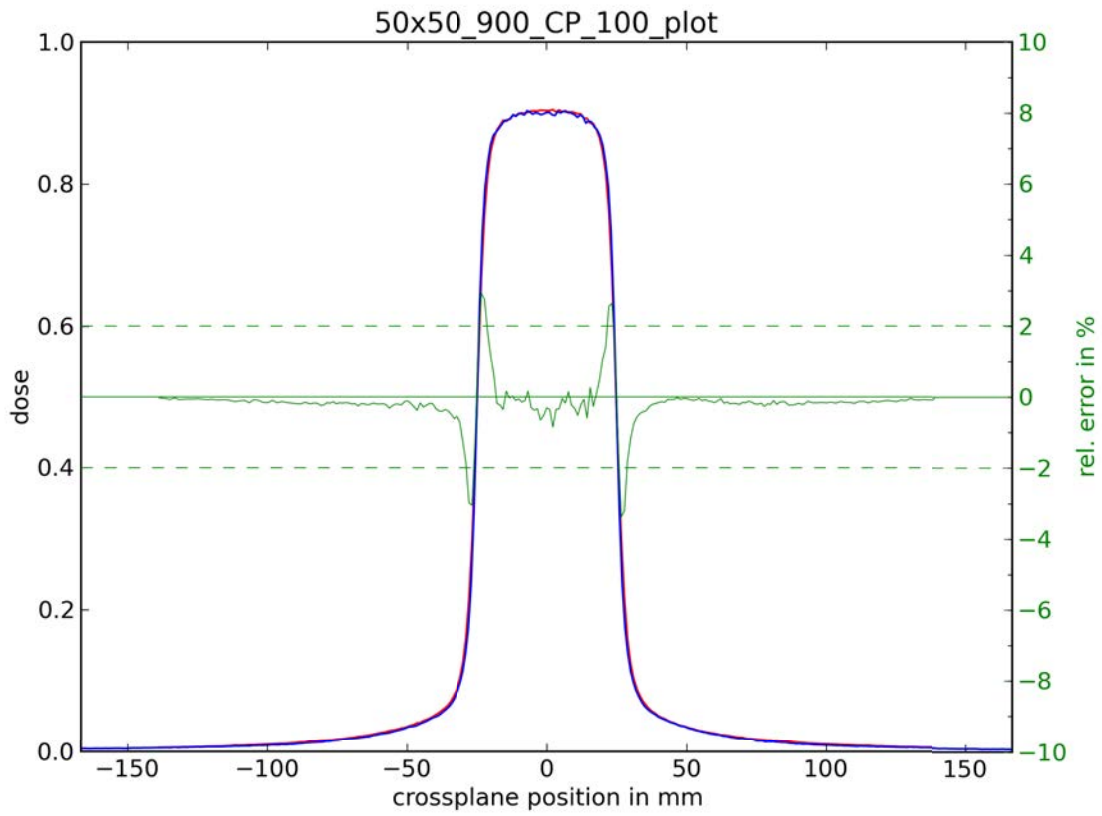
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 50x50 mm, depth 50 mm (PTW 60017 Diode E)**



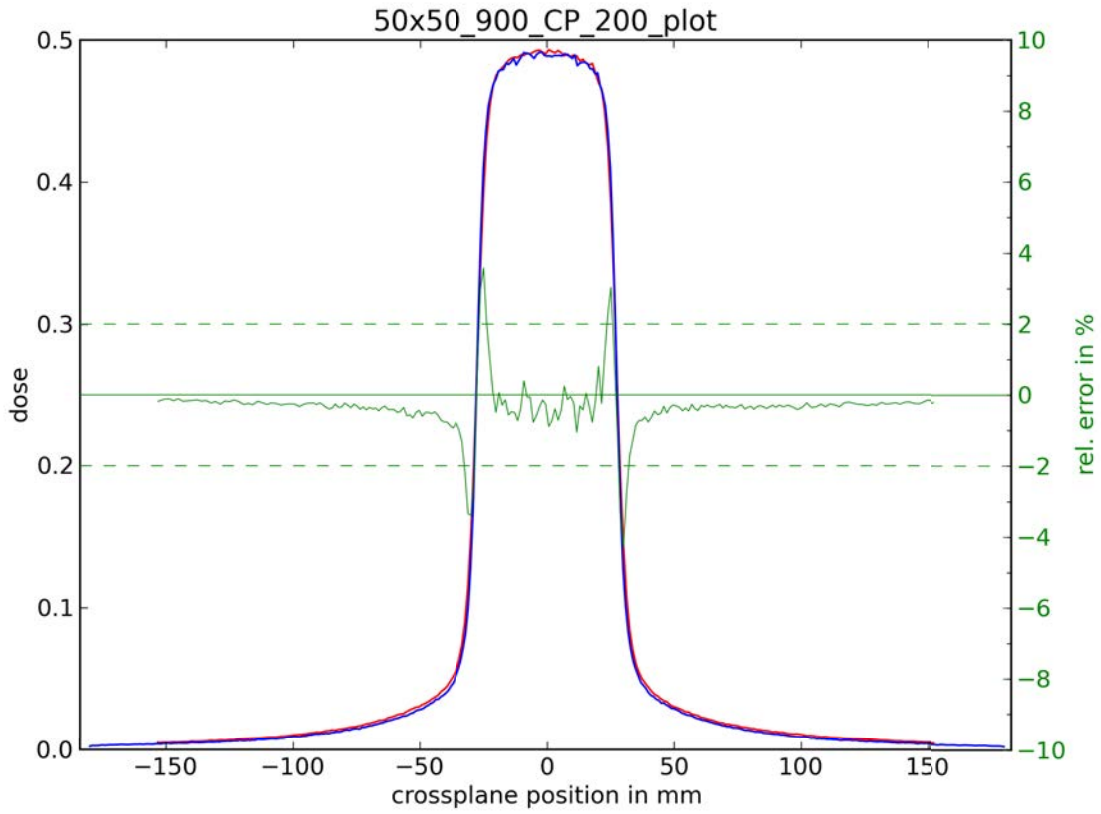
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 50x50 mm, depth 100 mm (PTW 60017 Diode E)**



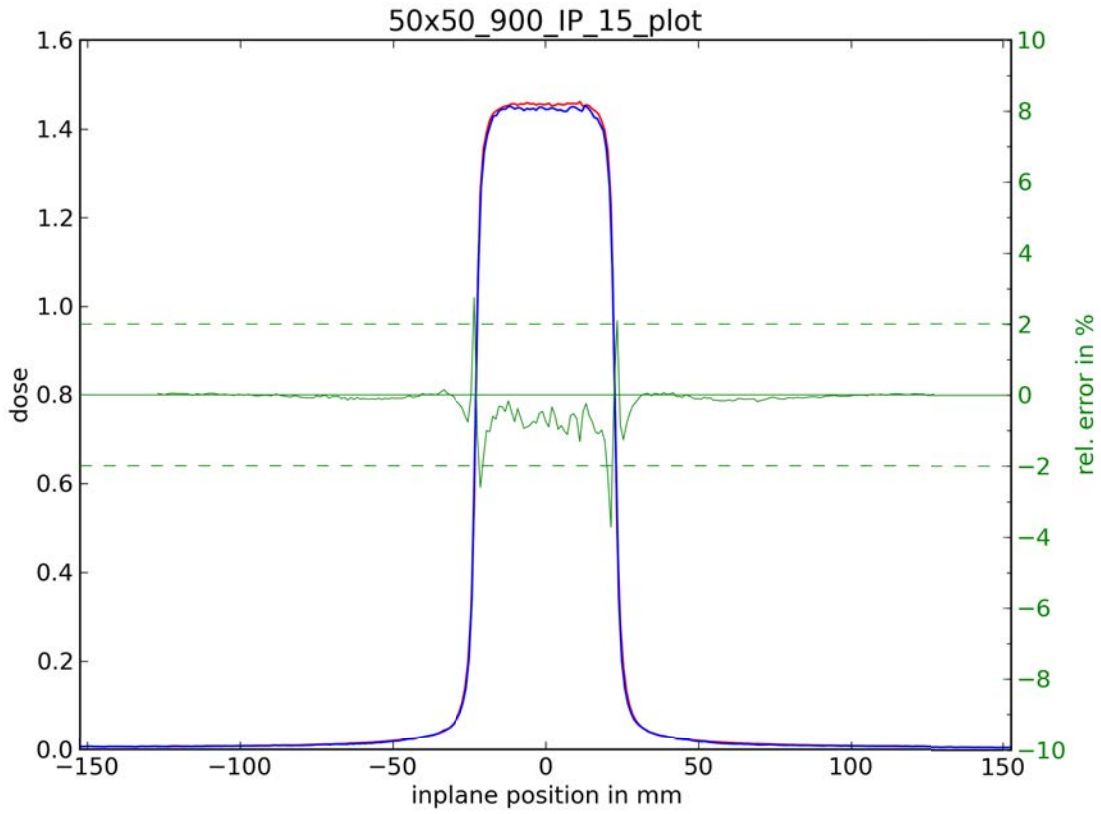
red: measurement; blue: simulation; green: rel. error

CROSSPLANE-Profiles: field size 50x50 mm, depth 200 mm (PTW 60017 Diode E)



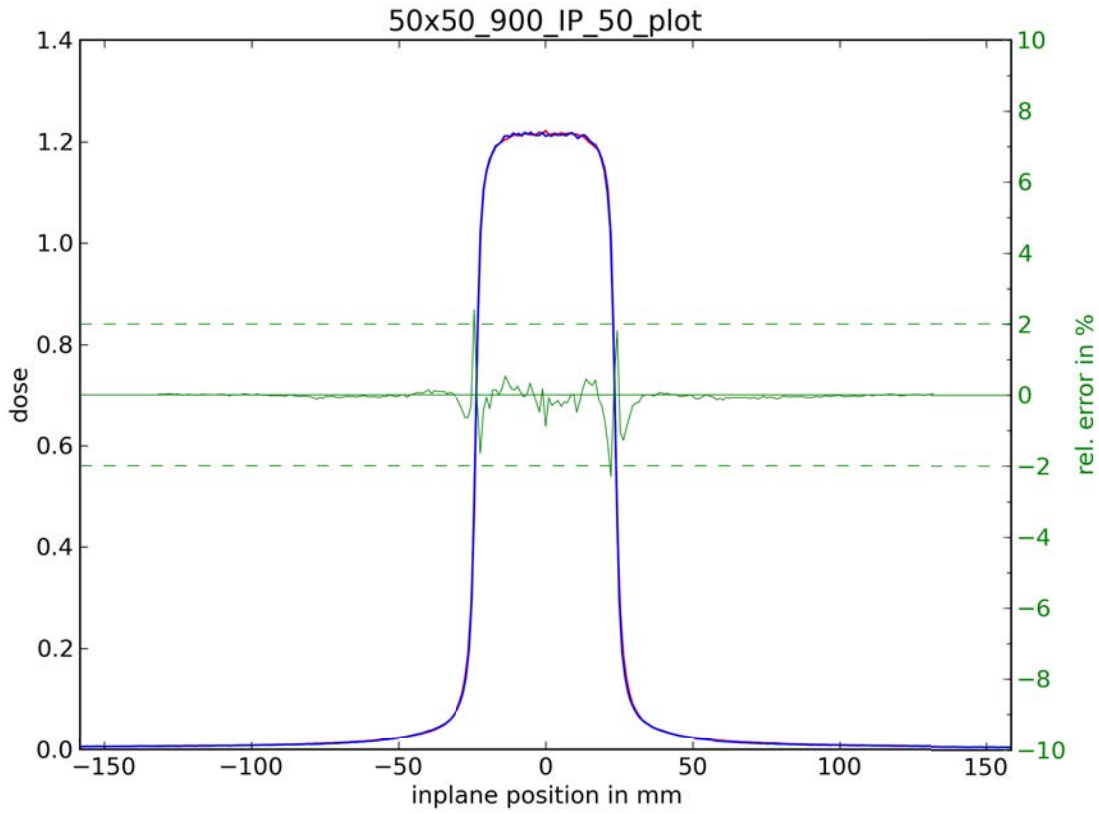
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 50x50 mm, depth 15 mm (PTW 60017 Diode E)**



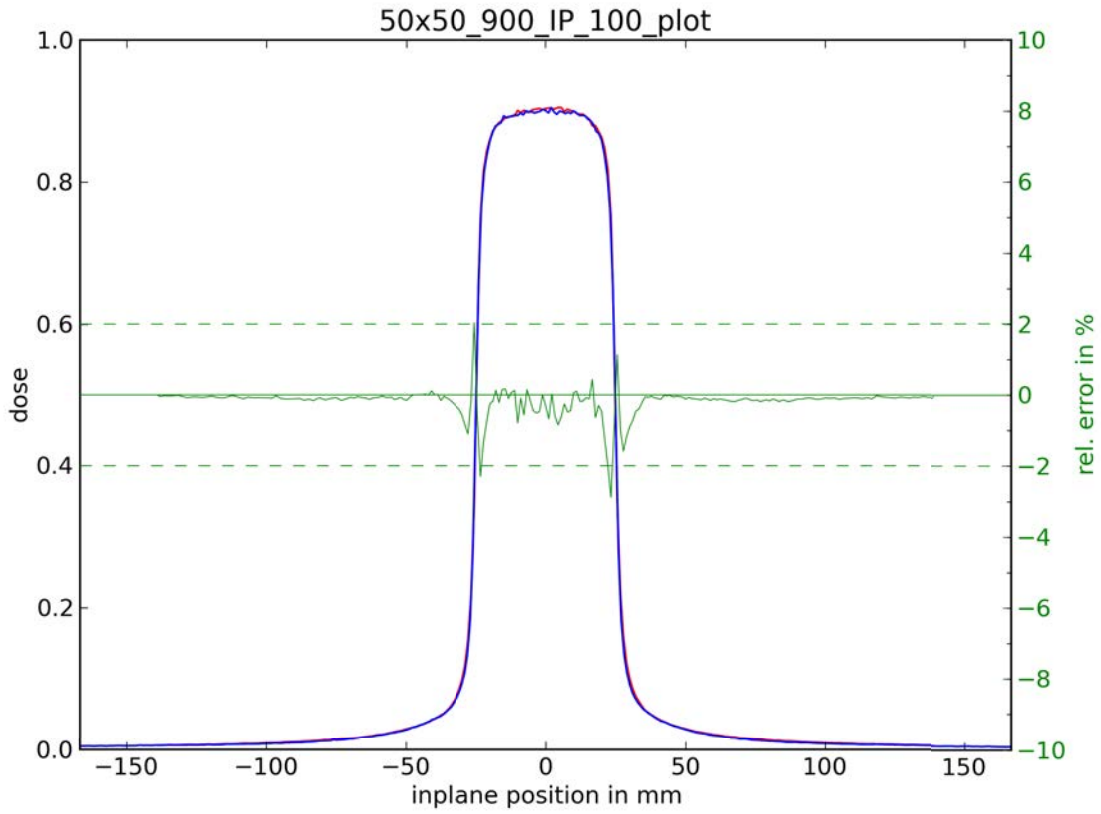
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 50x50 mm, depth 50 mm (PTW 60017 Diode E)**



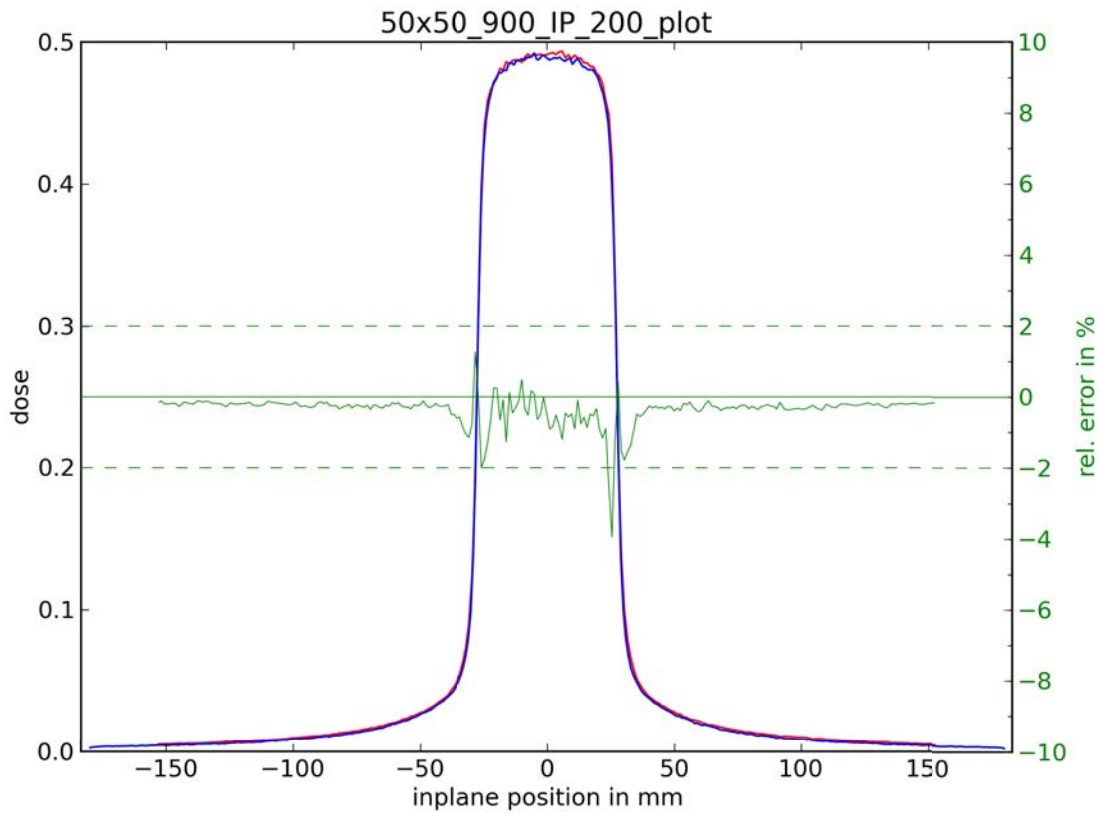
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 50x50 mm, depth 100 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

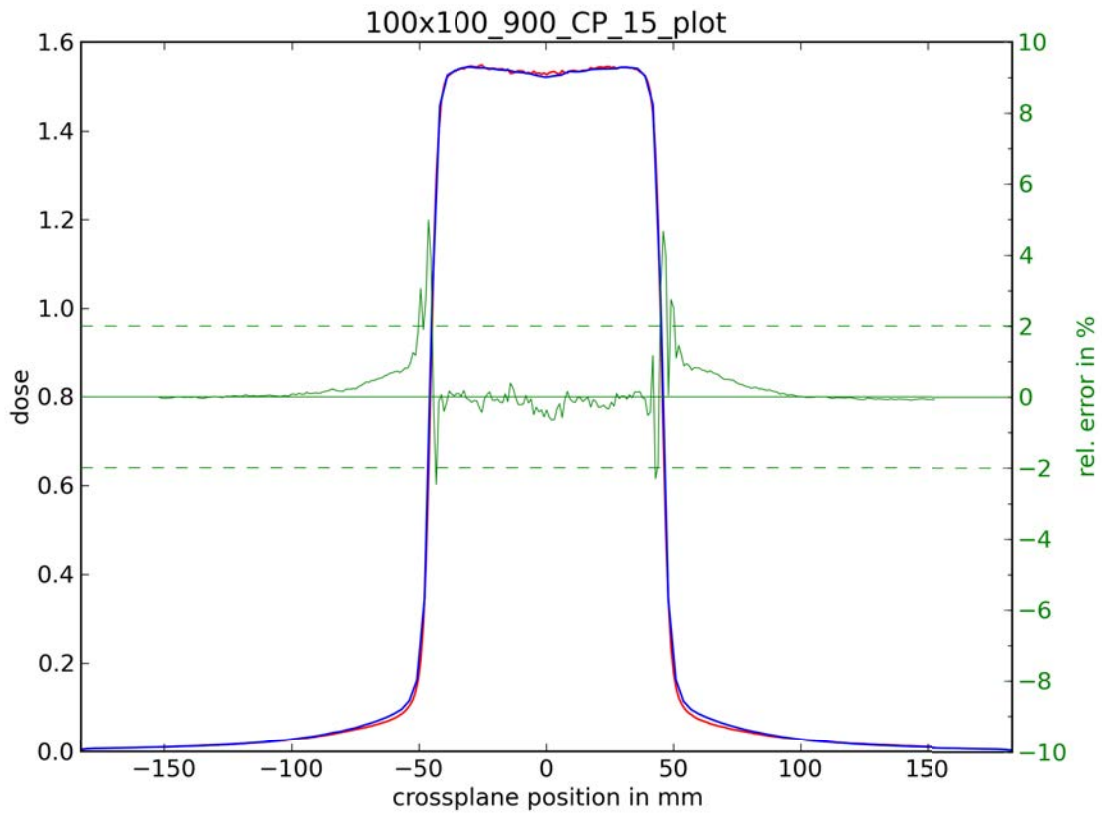
**INPLANE-Profiles: field size 50x50 mm, depth 200 mm (PTW 60017 Diode E)**



red: measurement; blue: simulation; green: rel. error

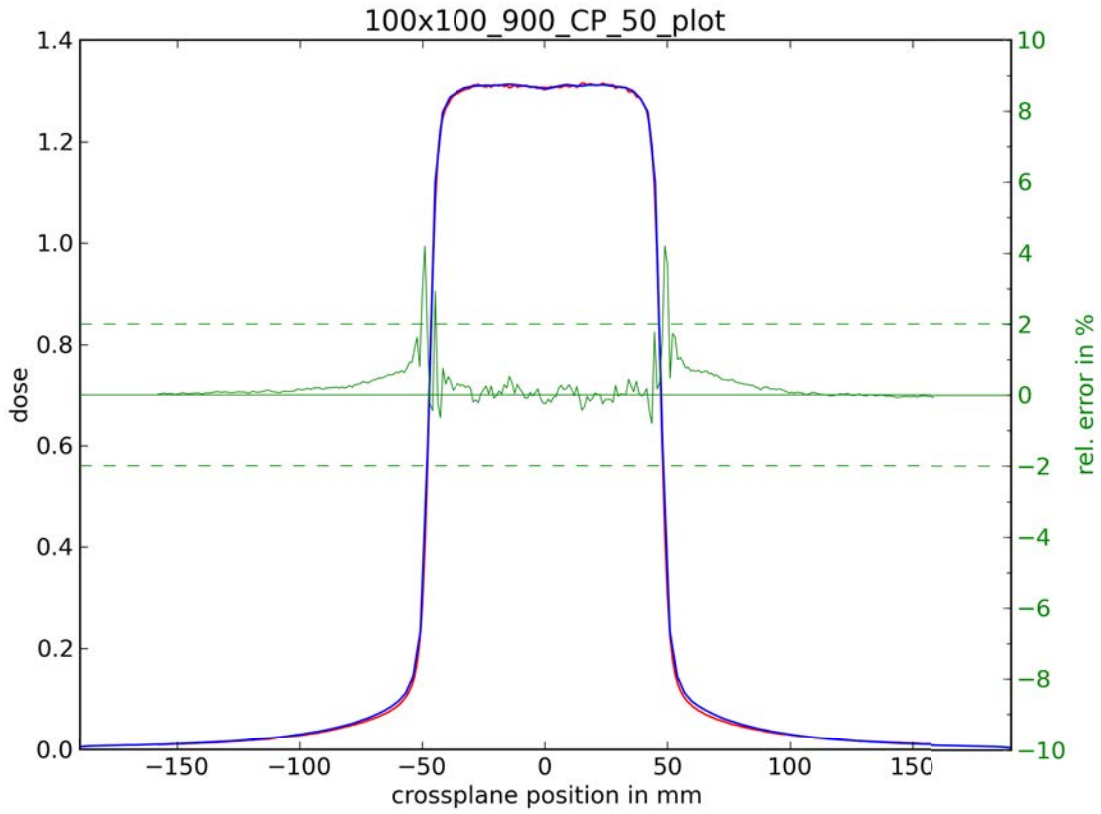


**CROSSPLANE-Profiles: field size 100x100 mm, depth 15 mm (PTW 60016 Diode P)**



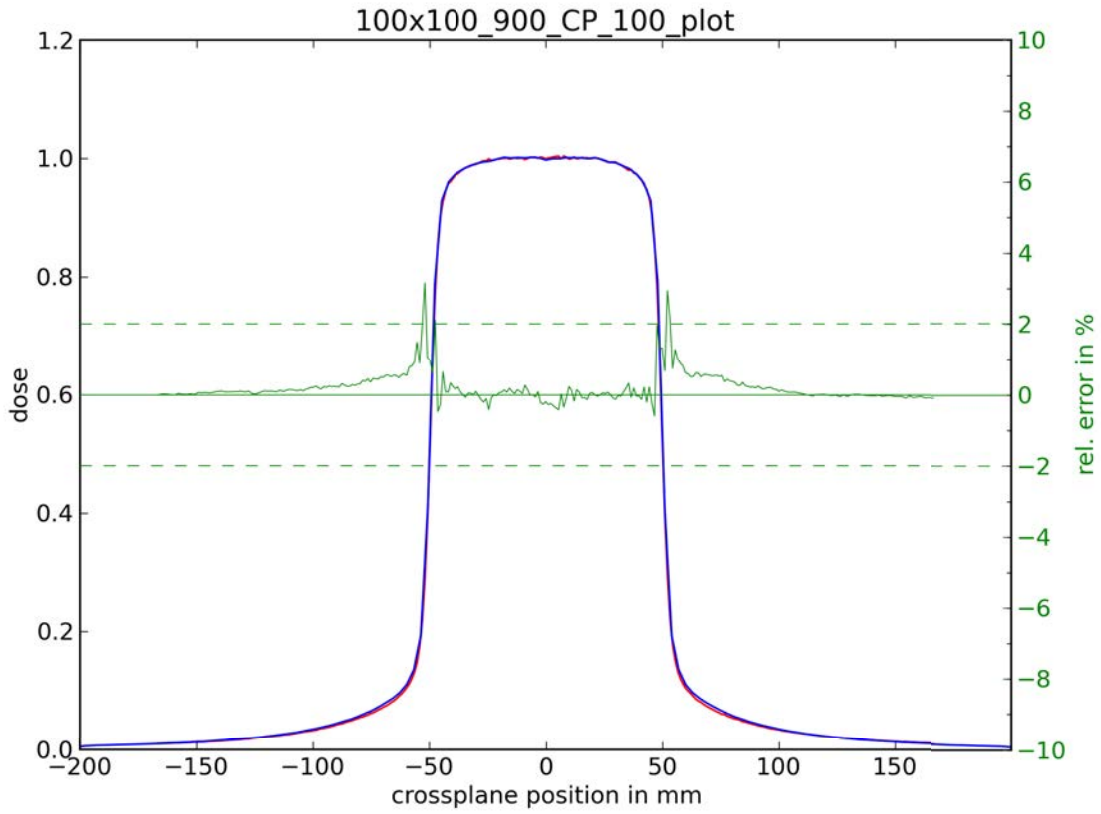
red: measurement; blue: simulation; green: rel. error

CROSSPLANE-Profiles: field size 100x100 mm, depth 50 mm (PTW 60016 Diode P)



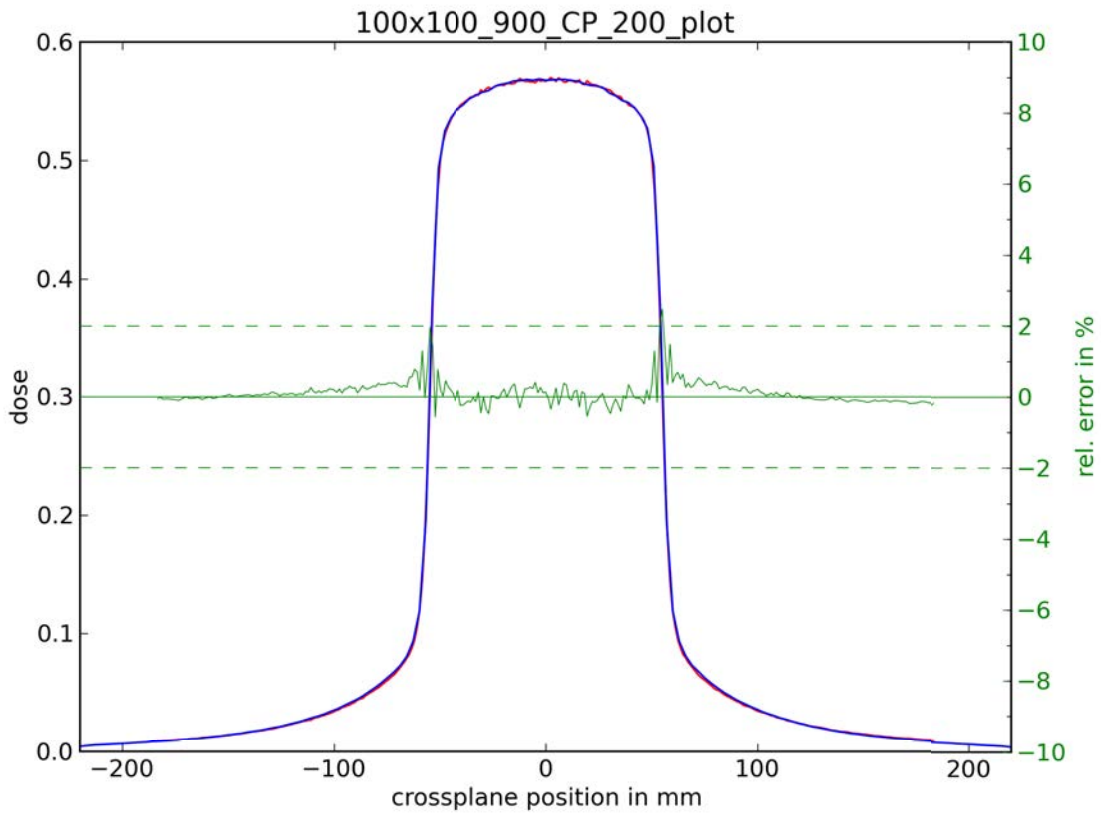
red: measurement; blue: simulation; green: rel. error

CROSSPLANE-Profiles: field size 100x100 mm, depth 100 mm (PTW 60016 Diode P)



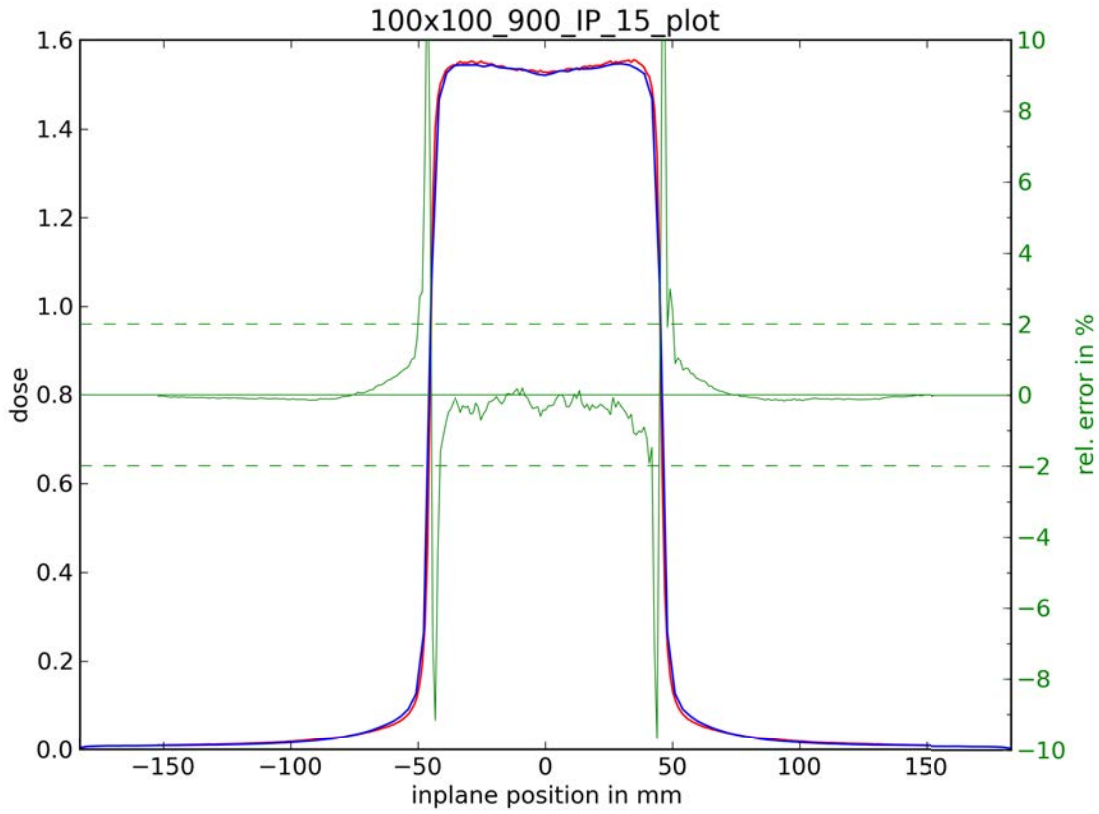
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 100x100 mm, depth 200 mm (PTW 60016 Diode P)**



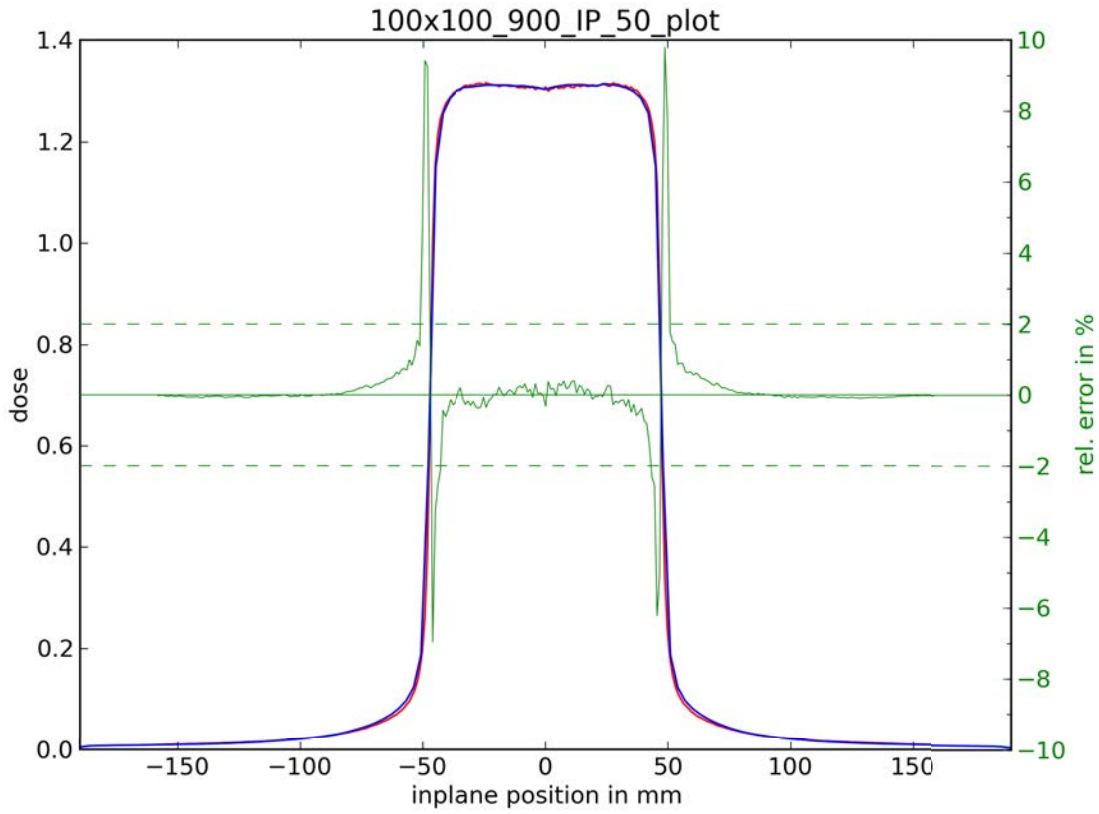
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 100x100 mm, depth 15 mm (PTW 60016 Diode P)**



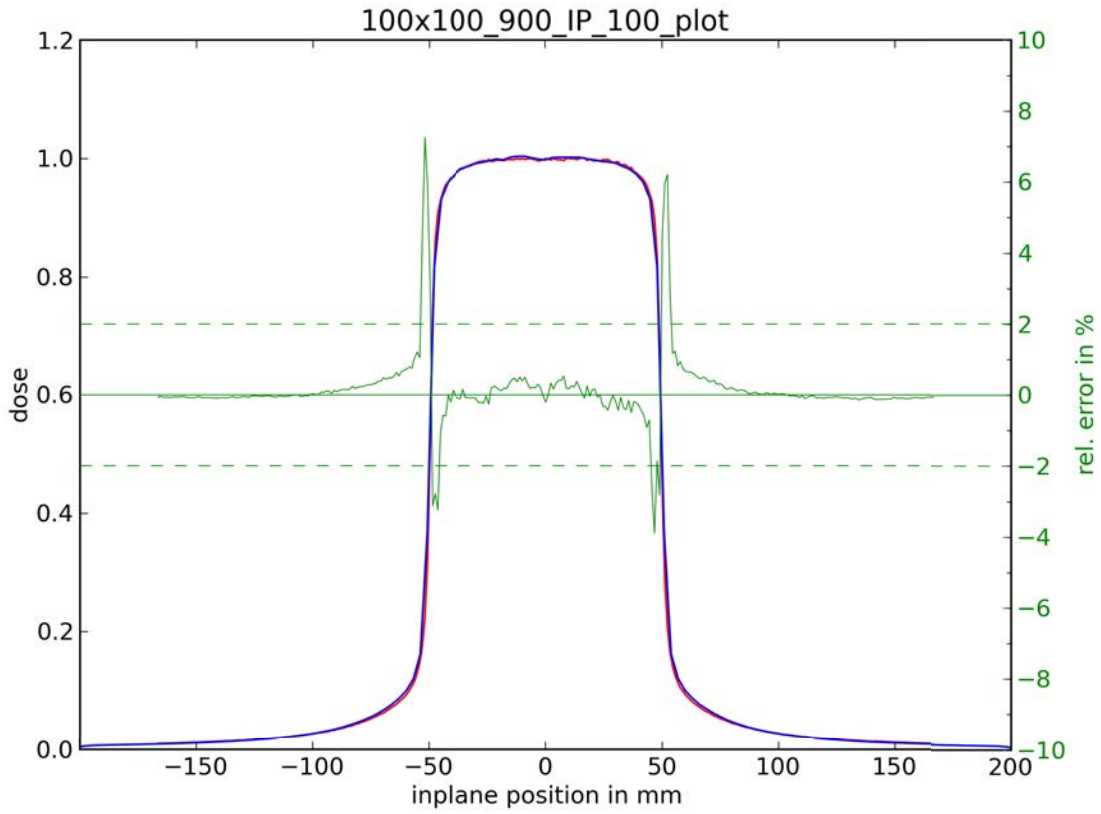
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 100x100 mm, depth 50 mm (PTW 60016 Diode P)**



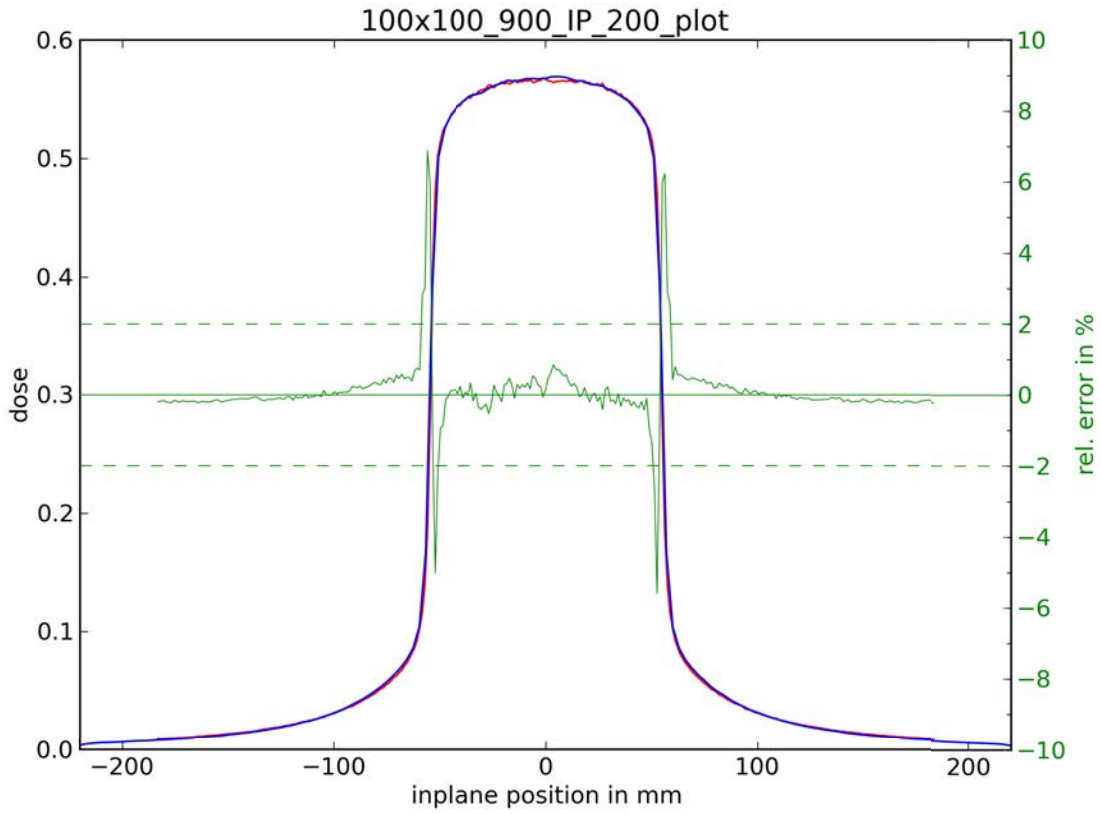
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 100x100 mm, depth 100 mm (PTW 60016 Diode P)**



red: measurement; blue: simulation; green: rel. error

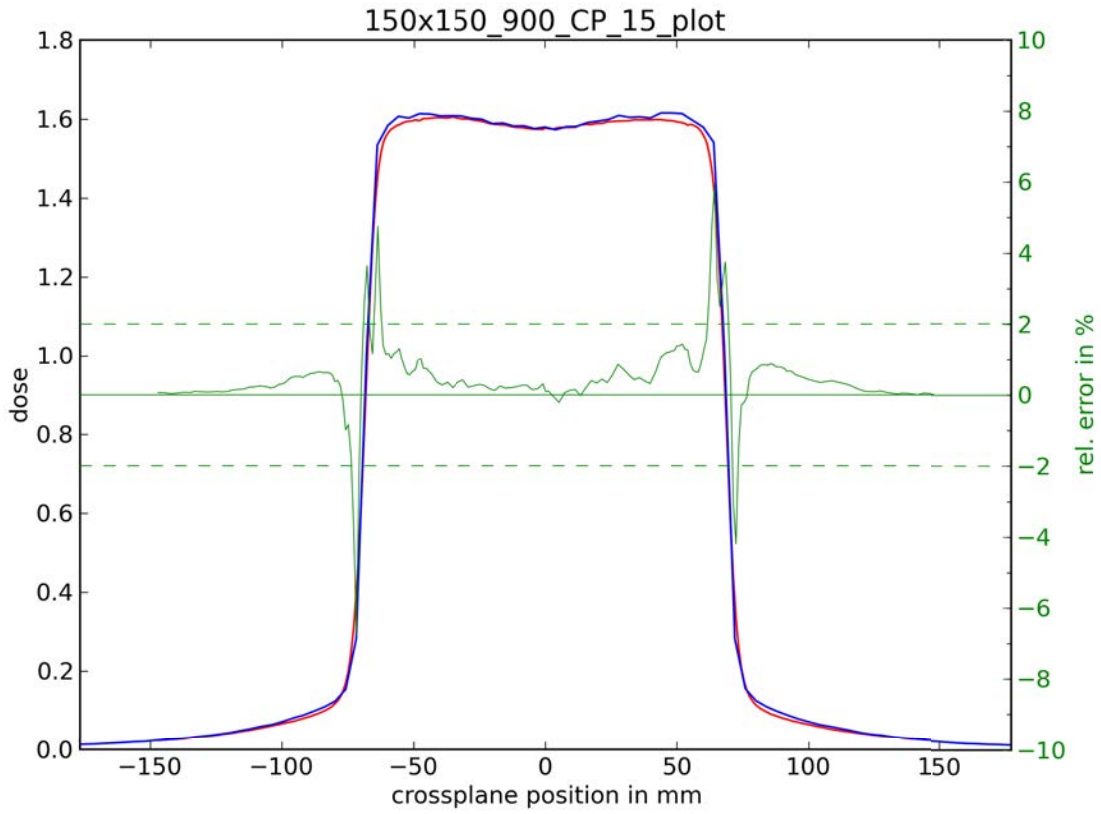
**INPLANE-Profiles: field size 100x100 mm, depth 200 mm (PTW 60016 Diode P)**



red: measurement; blue: simulation; green: rel. error

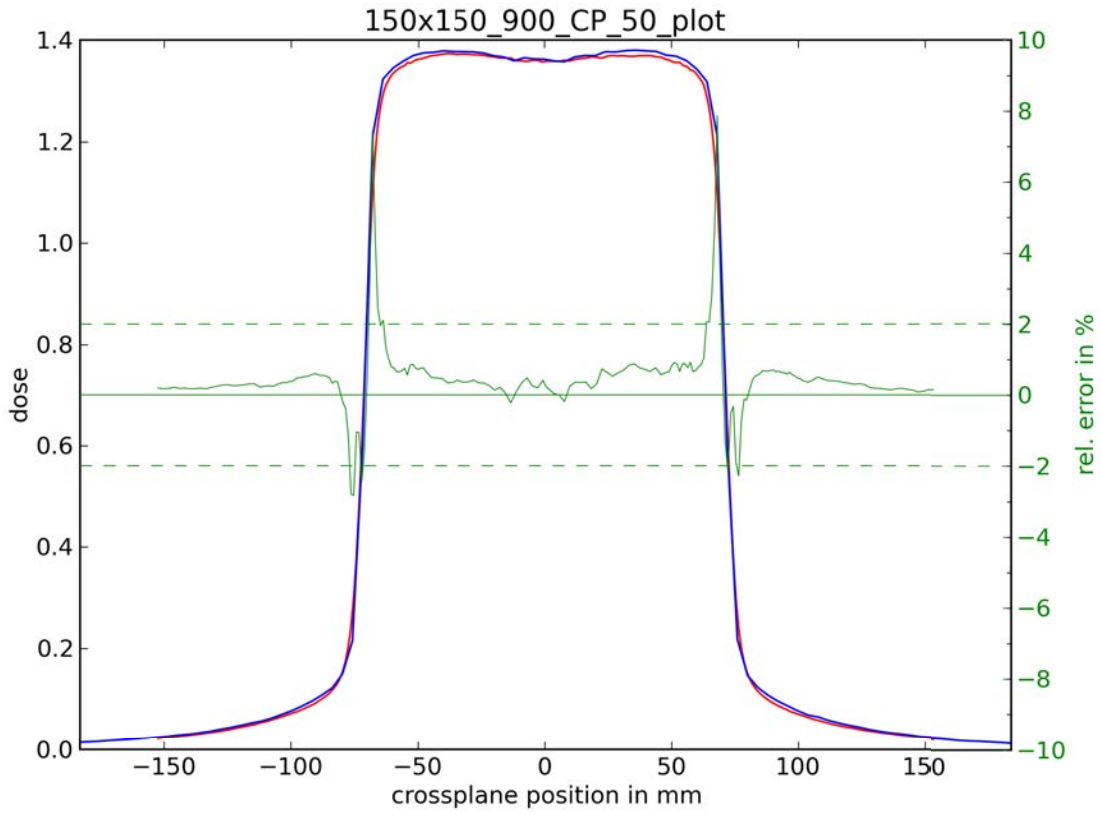


**CROSSPLANE-Profiles: field size 150x150 mm, depth 15 mm (PTW 31010 Semiflex)**



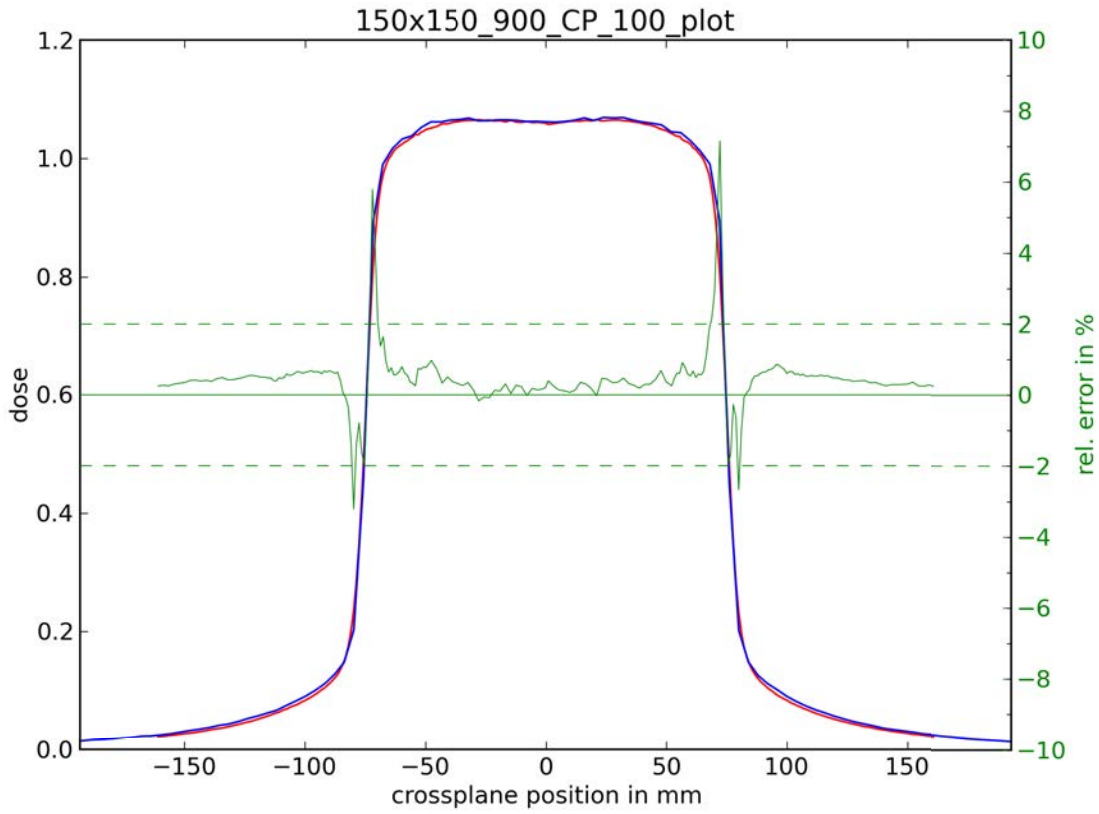
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 150x150 mm, depth 50 mm (PTW 31010 Semiflex)**



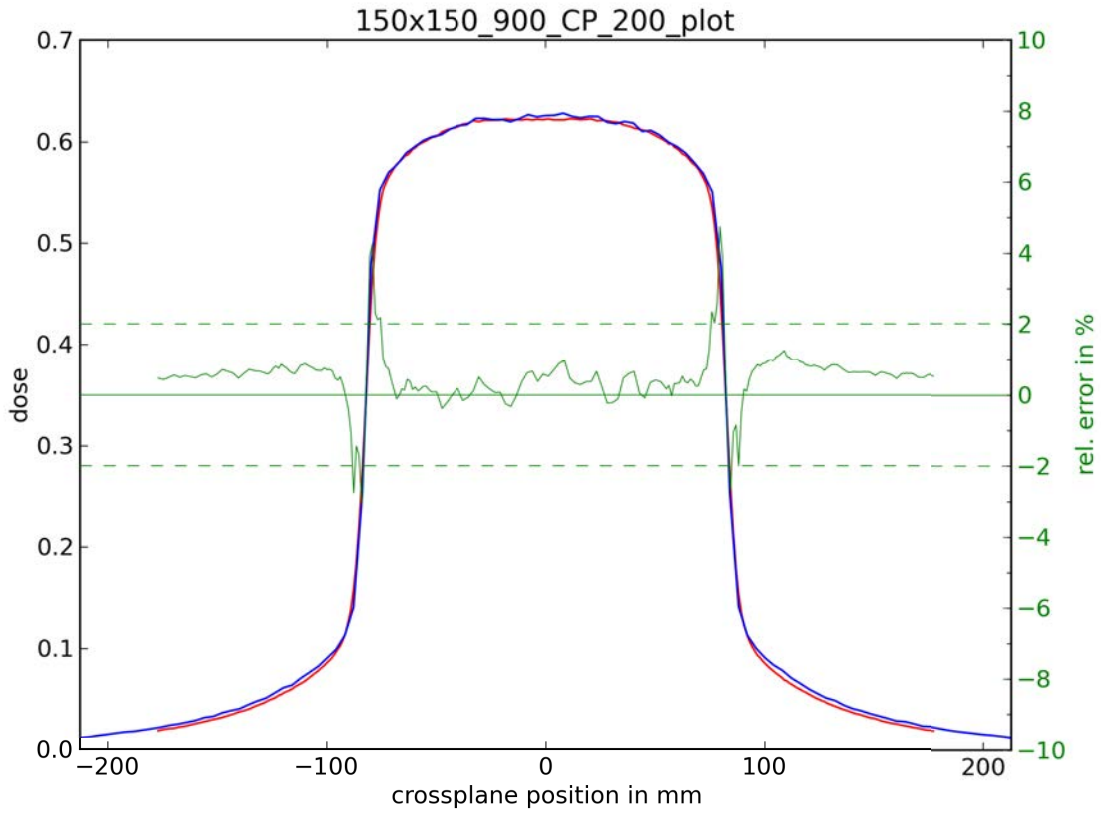
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 150x150 mm, depth 100 mm (PTW 31010 Semiflex)**



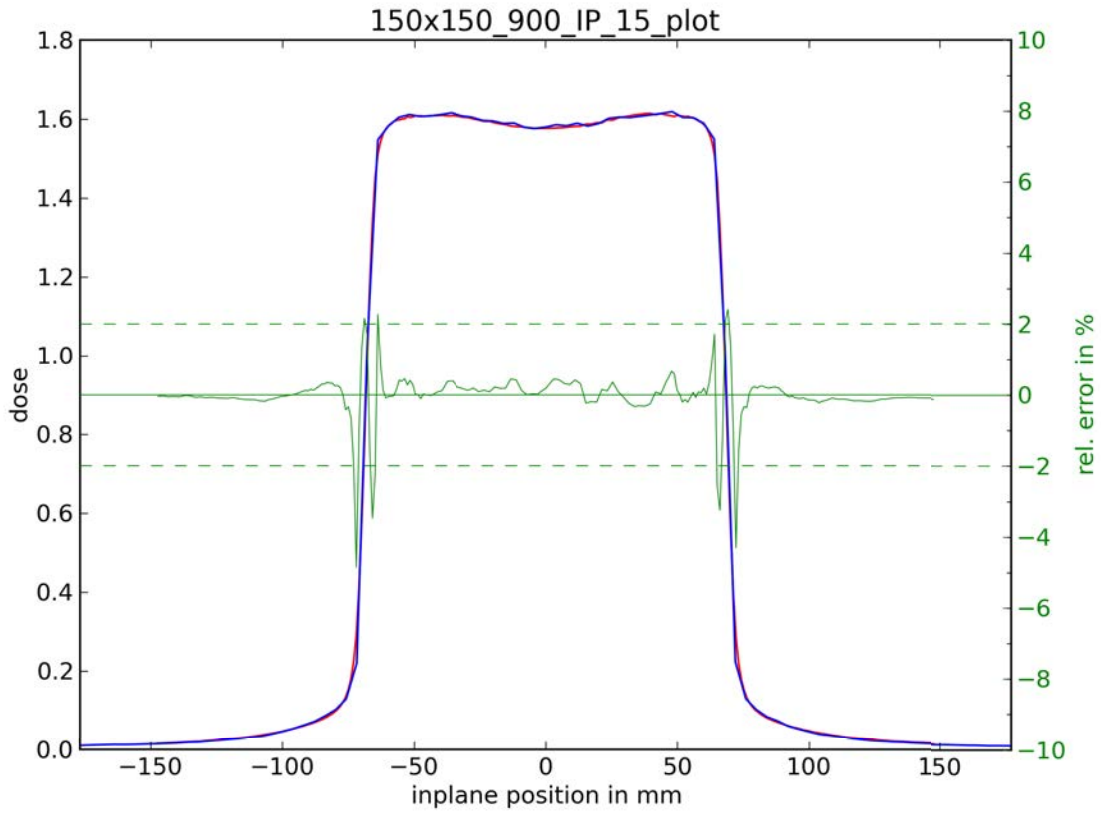
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 150x150 mm, depth 200 mm (PTW 31010 Semiflex)**



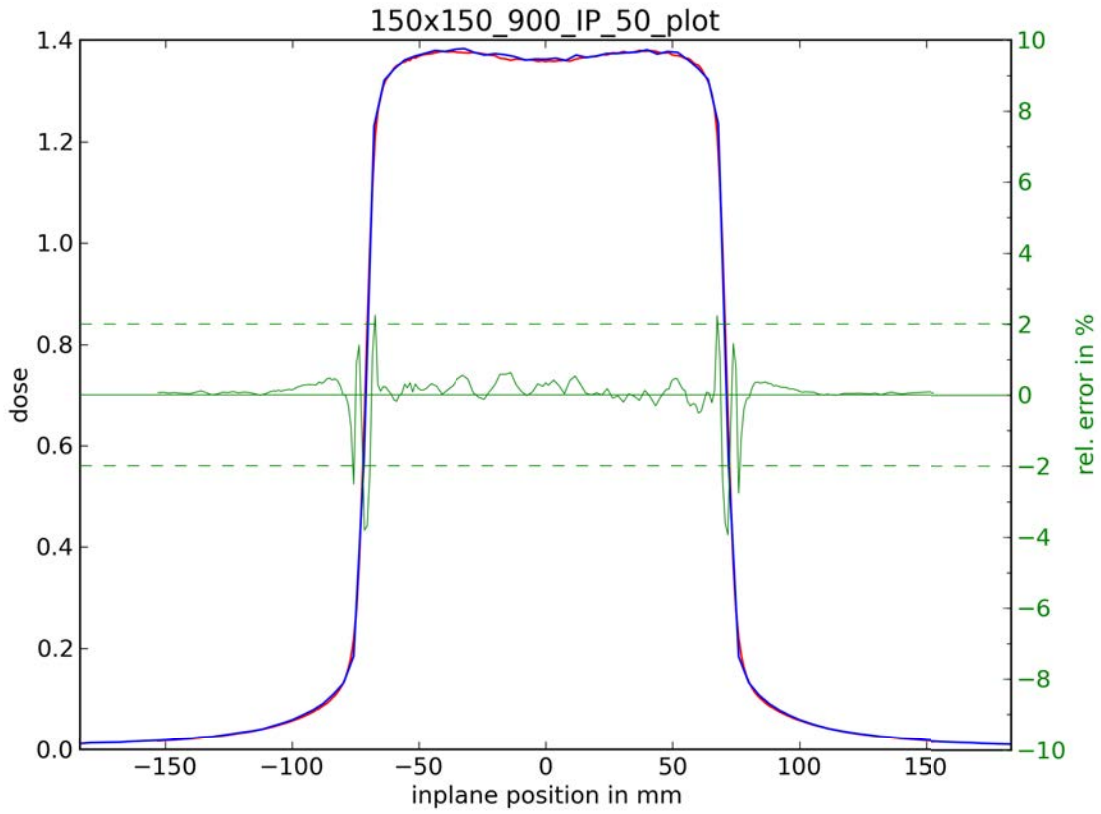
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 150x150 mm, depth 15 mm (PTW 31010 Semiflex)**



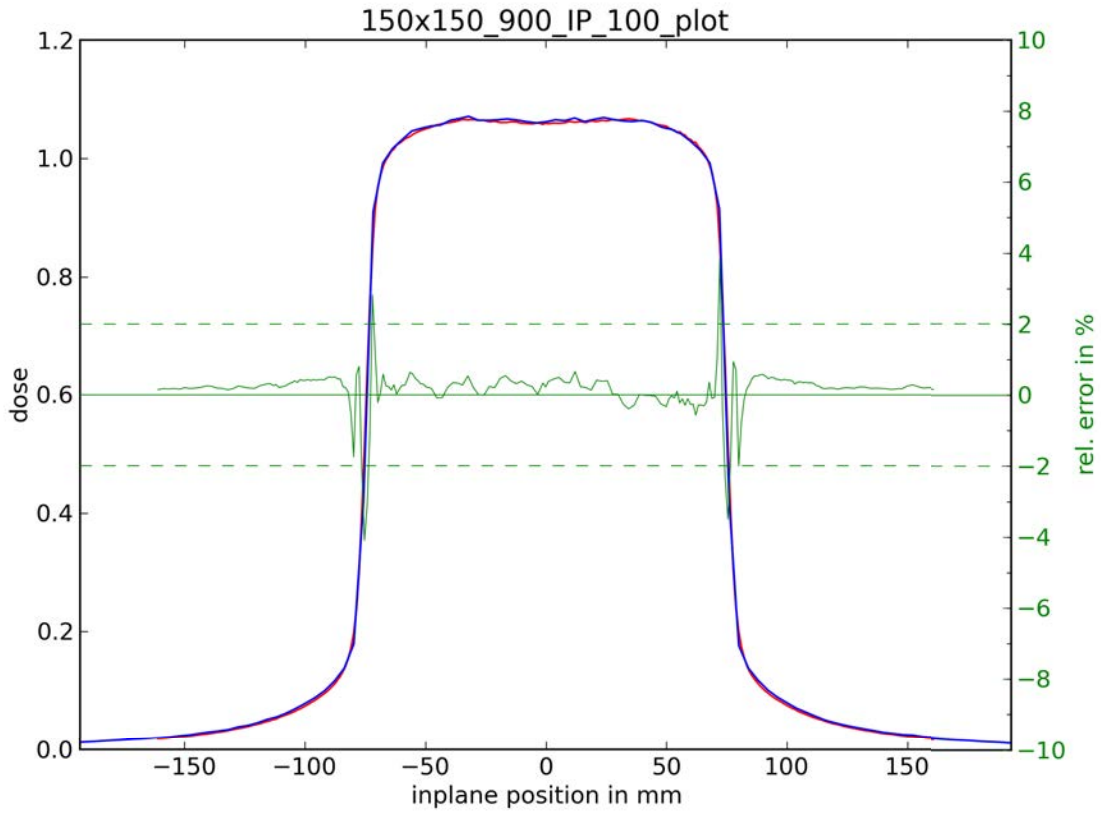
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 150x150 mm, depth 50 mm (PTW 31010 Semiflex)**



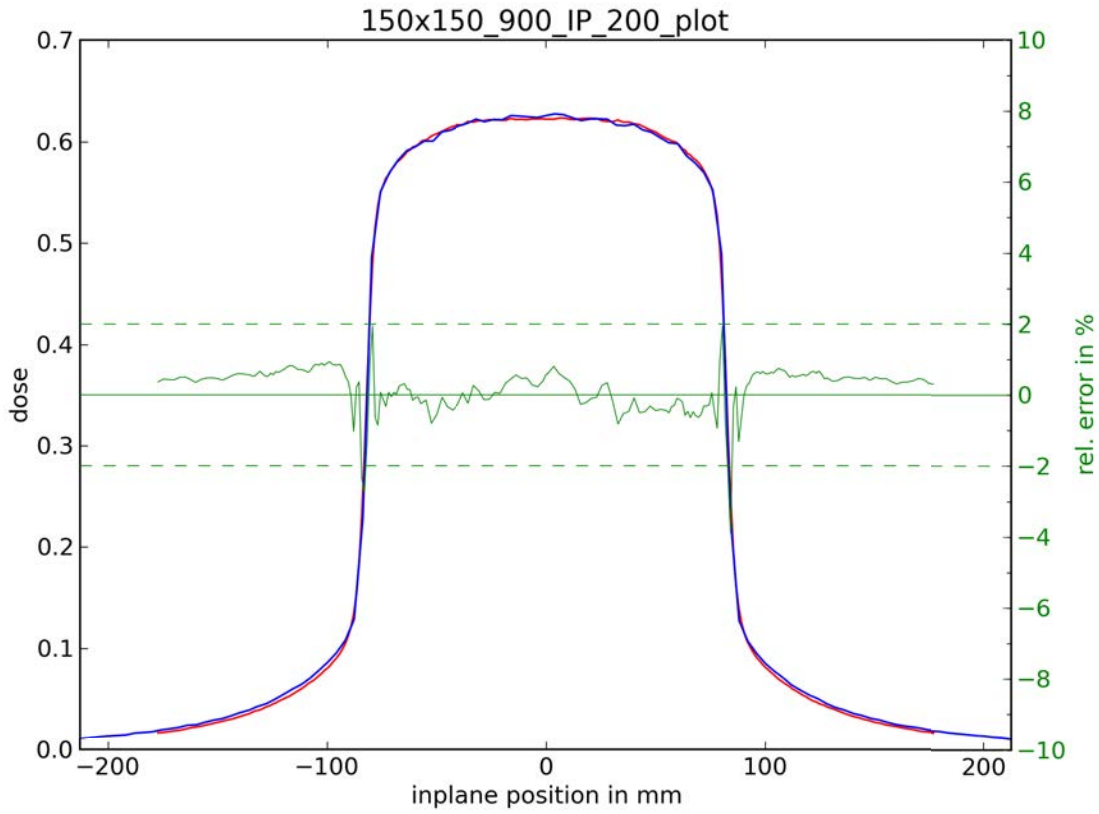
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 150x150 mm, depth 100 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

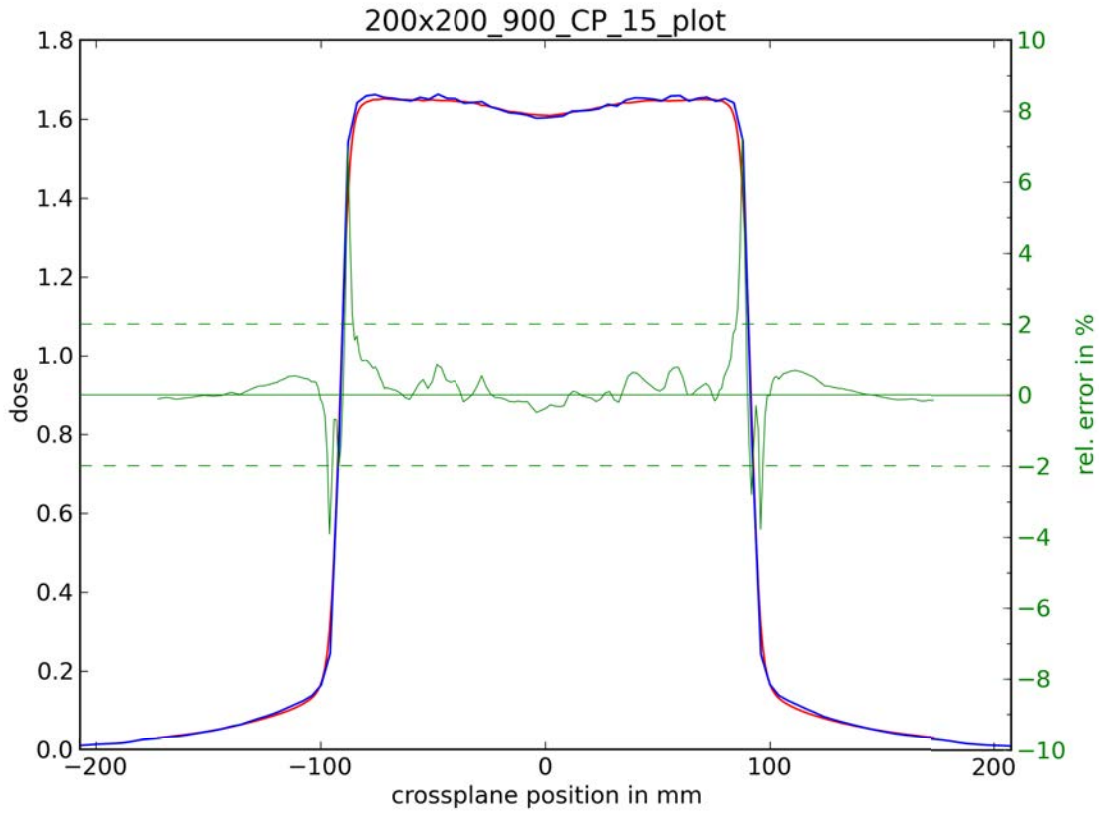
**INPLANE-Profiles: field size 150x150 mm, depth 200 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

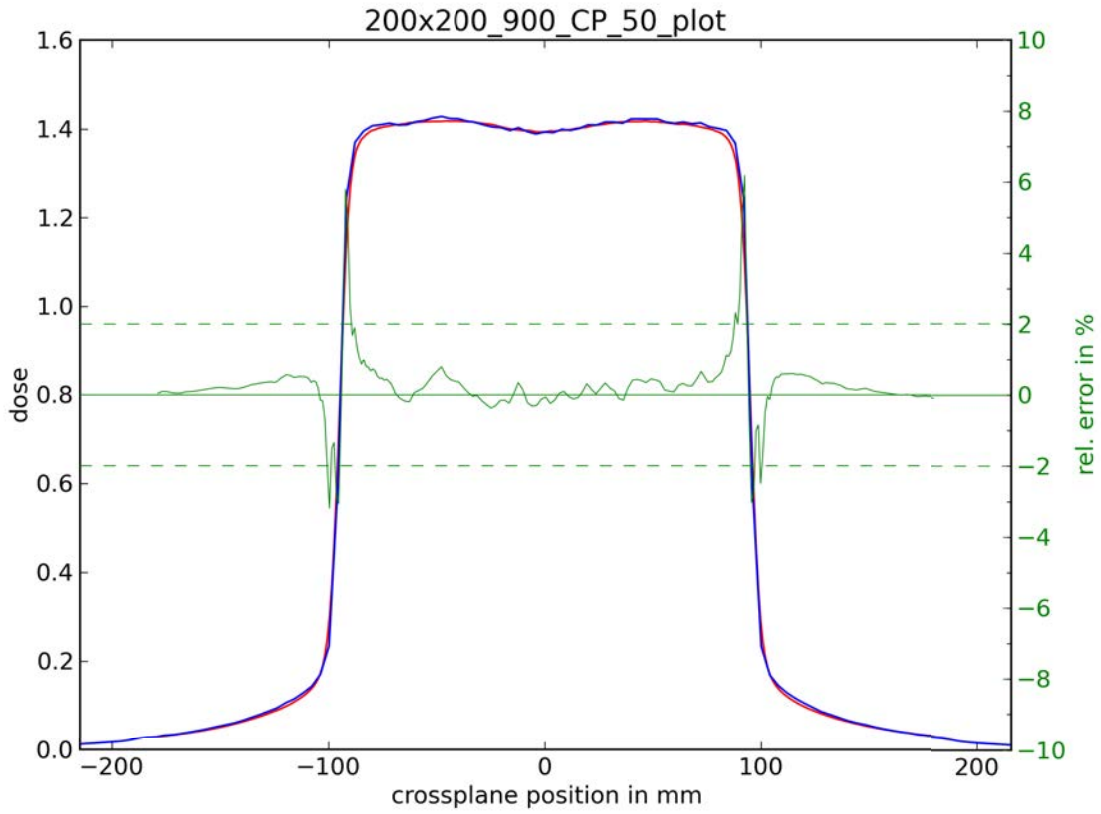


**CROSSPLANE-Profiles: field size 200x200 mm, depth 15 mm (PTW 31010 Semiflex)**



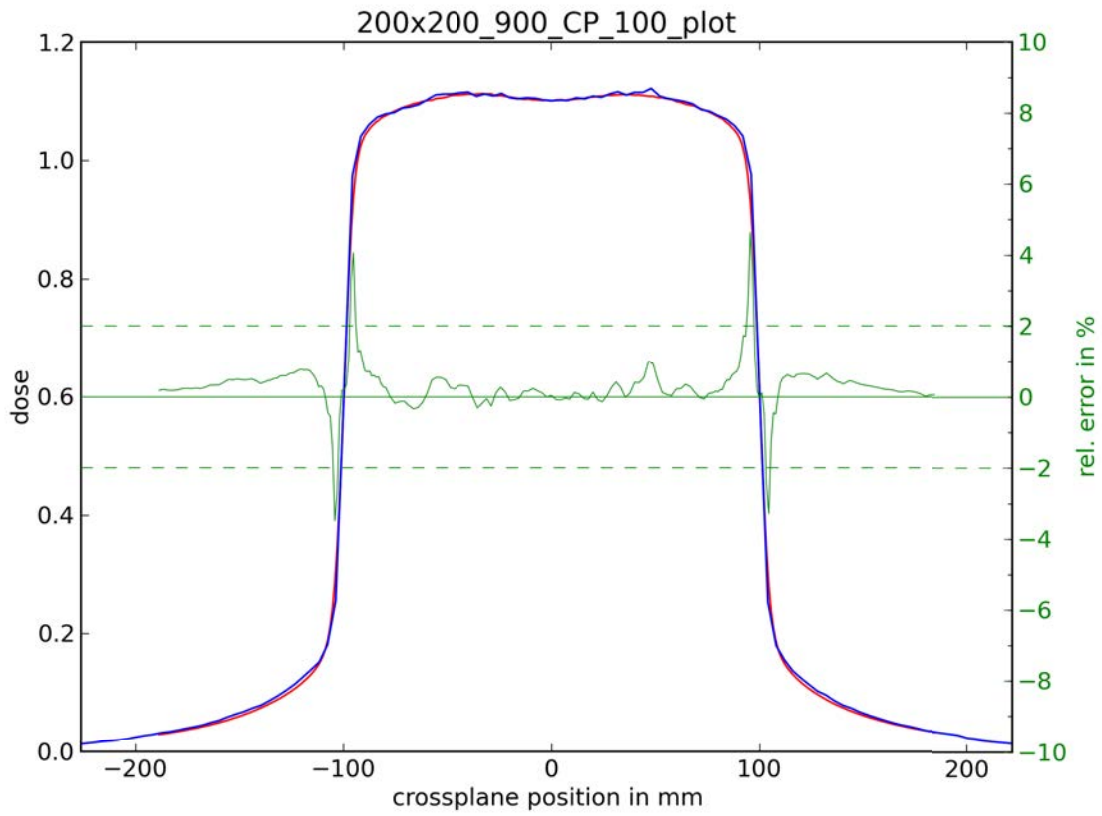
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 200x200 mm, depth 50 mm (PTW 31010 Semiflex)**



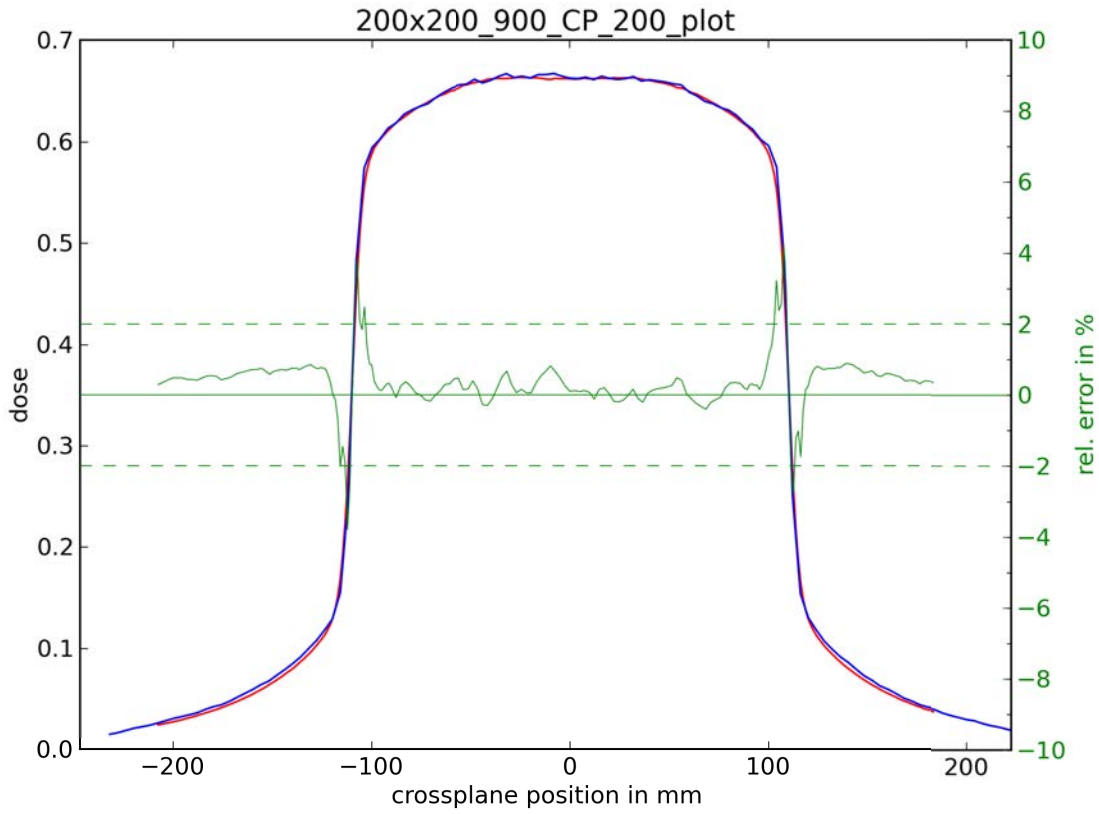
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 200x200 mm, depth 100 mm (PTW 31010 Semiflex)**



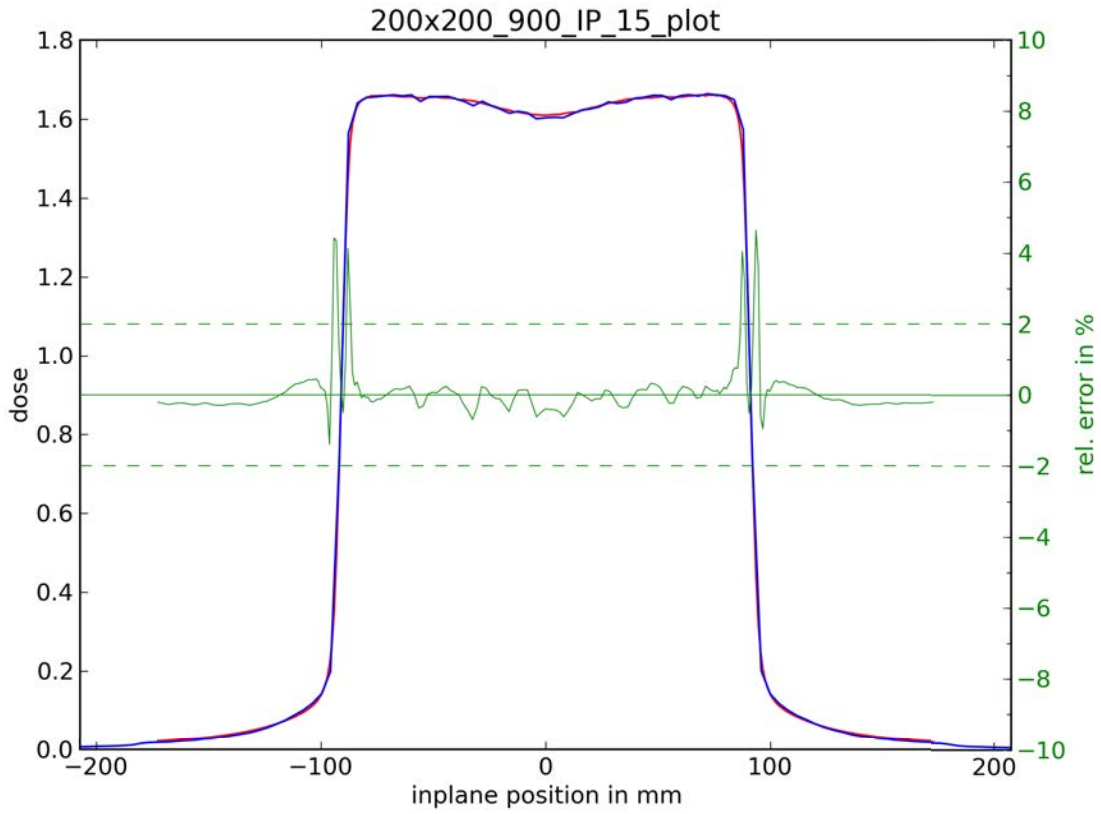
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 200x200 mm, depth 200 mm (PTW 31010 Semiflex)**



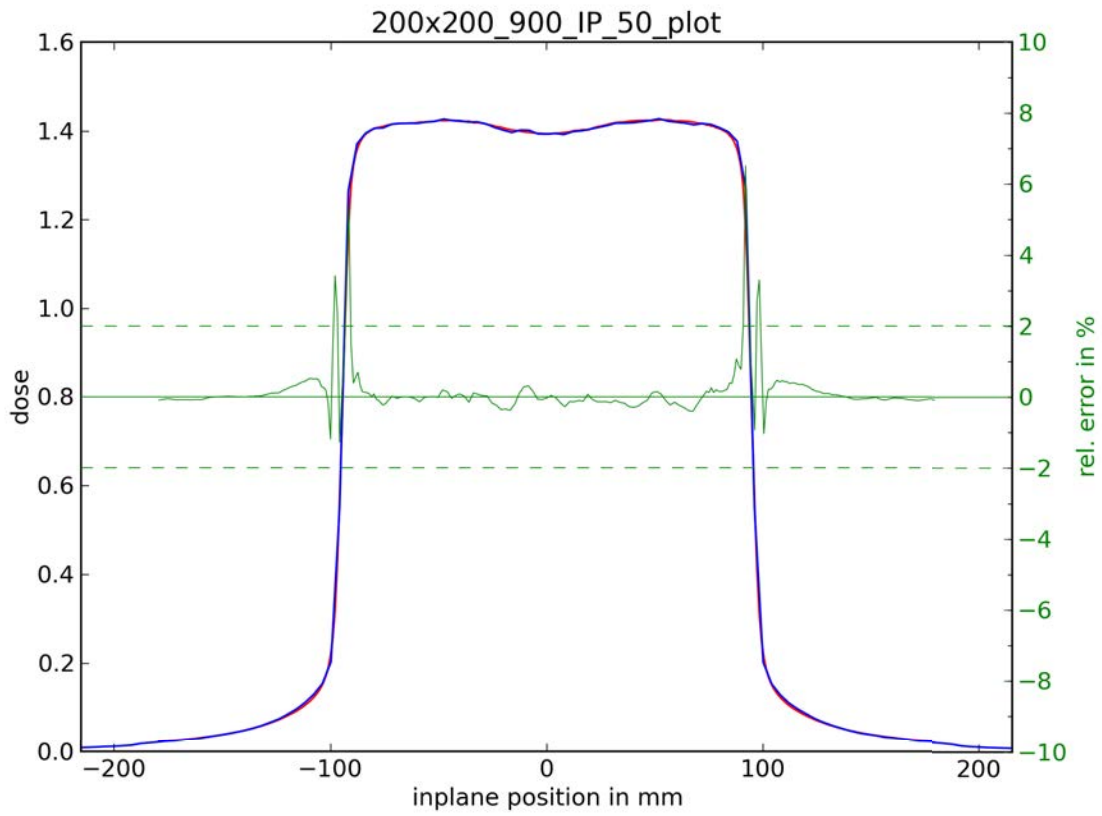
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 200x200 mm, depth 15 mm (PTW 31010 Semiflex)**



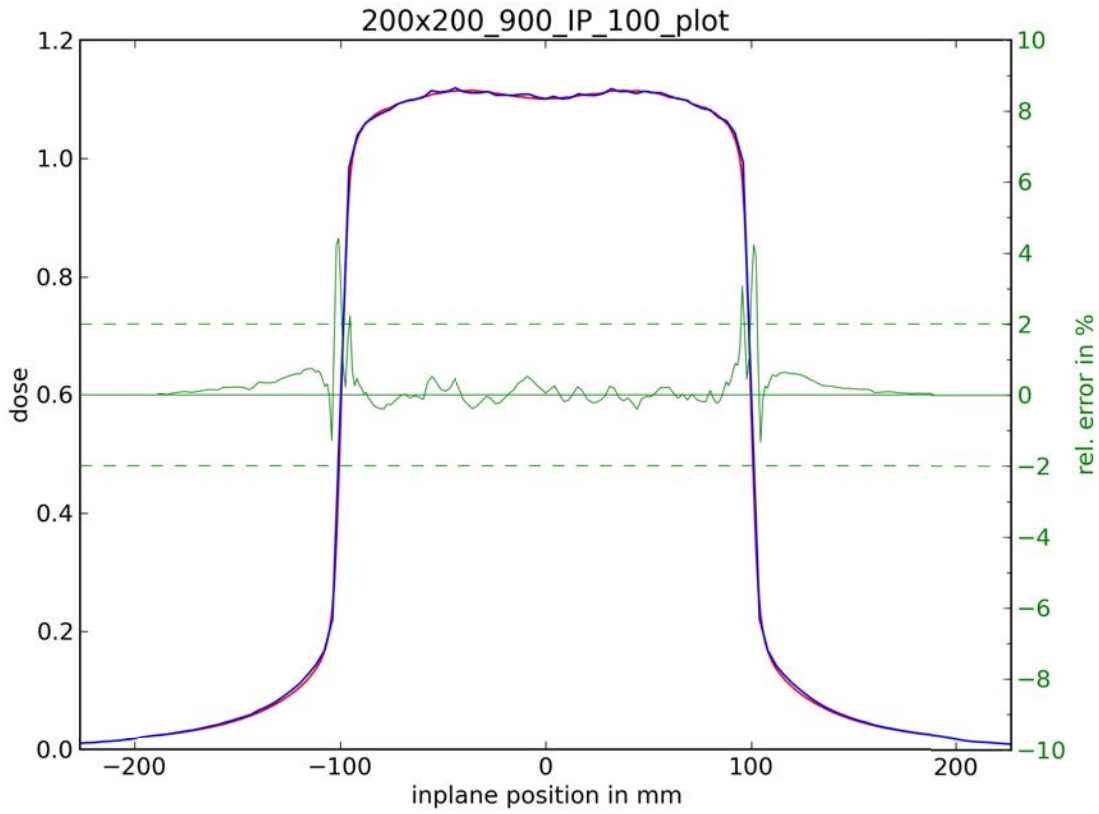
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 200x200 mm, depth 50 mm (PTW 31010 Semiflex)**



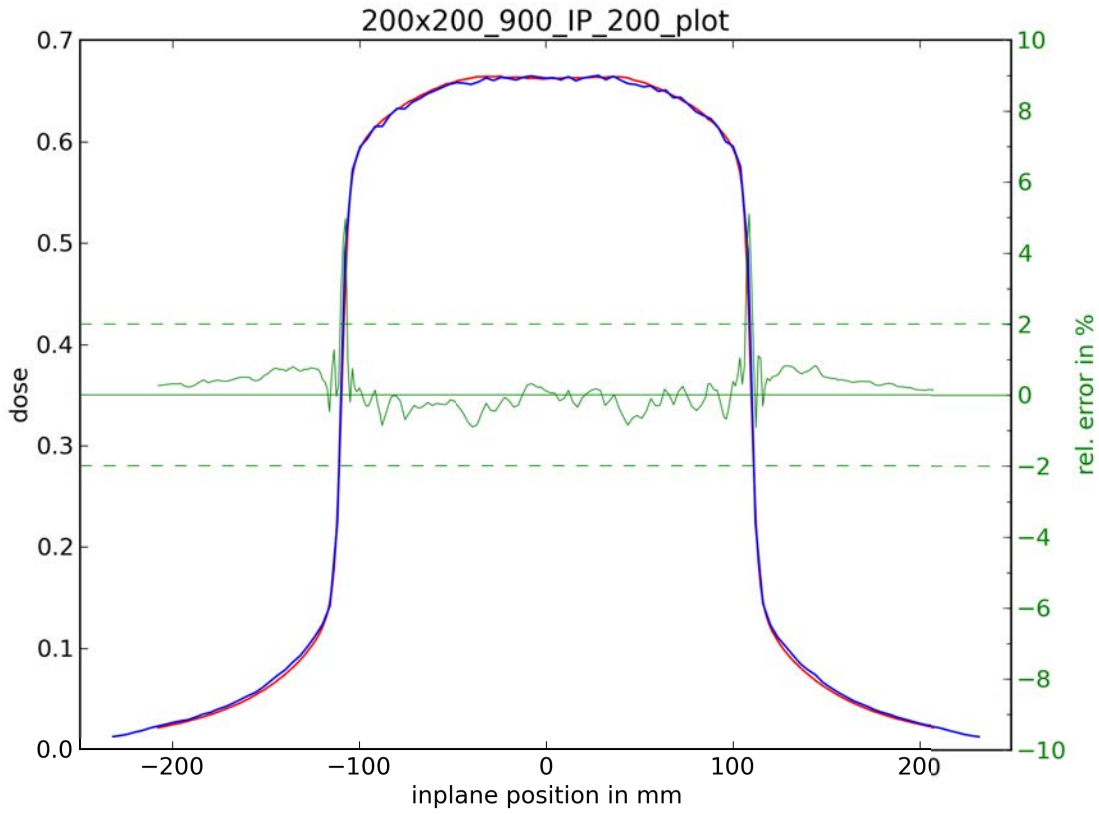
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 200x200 mm, depth 100 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

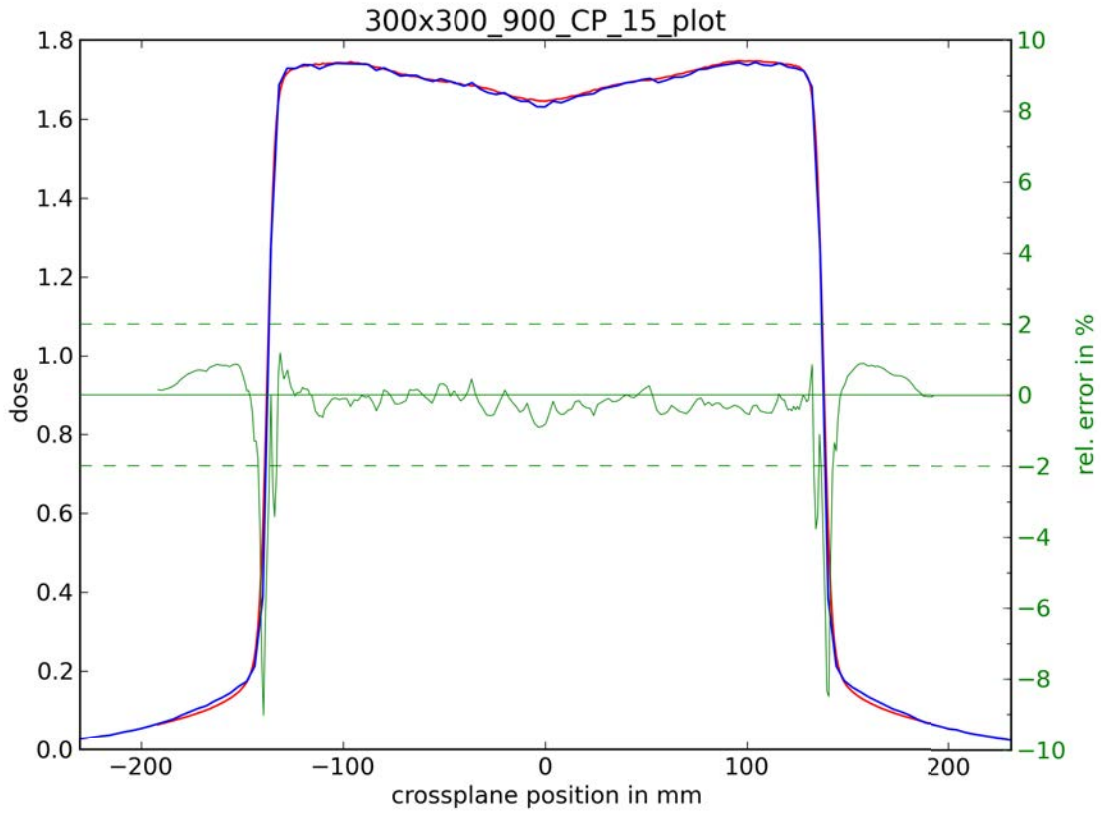
**INPLANE-Profiles: field size 200x200 mm, depth 200 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

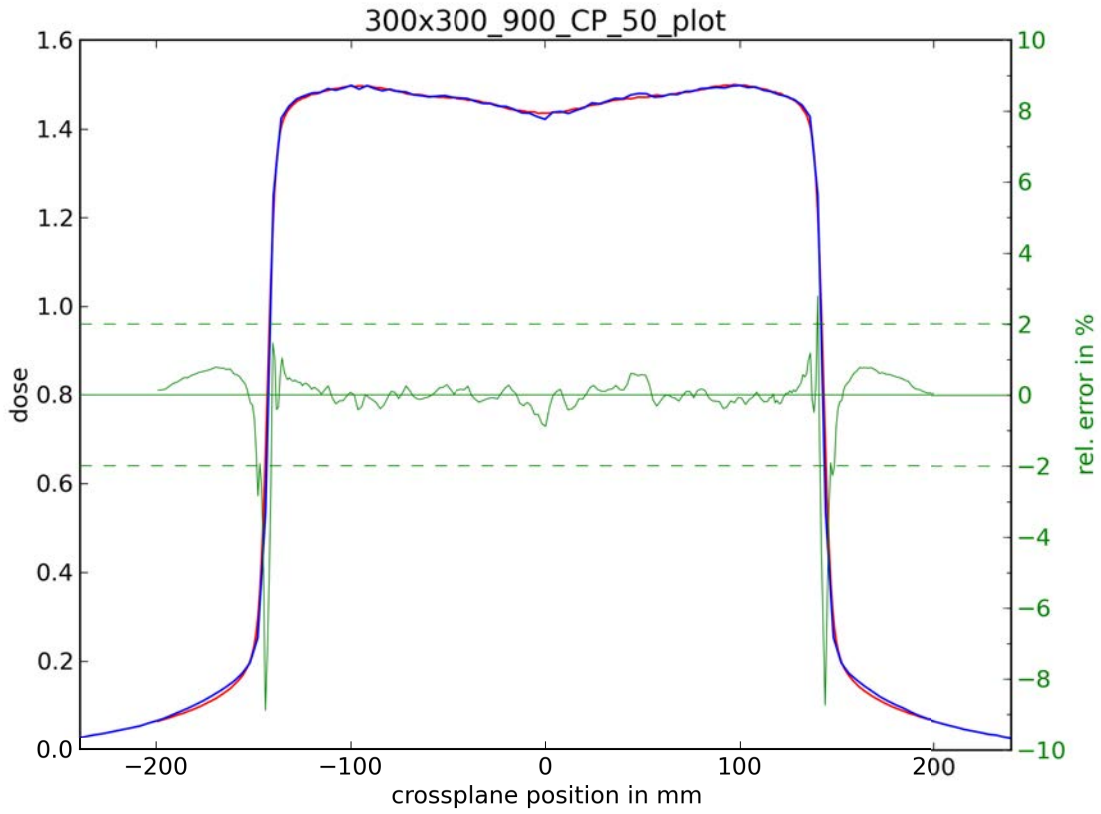


**CROSSPLANE-Profiles: field size 300x300 mm, depth 15 mm (PTW 31010 Semiflex)**



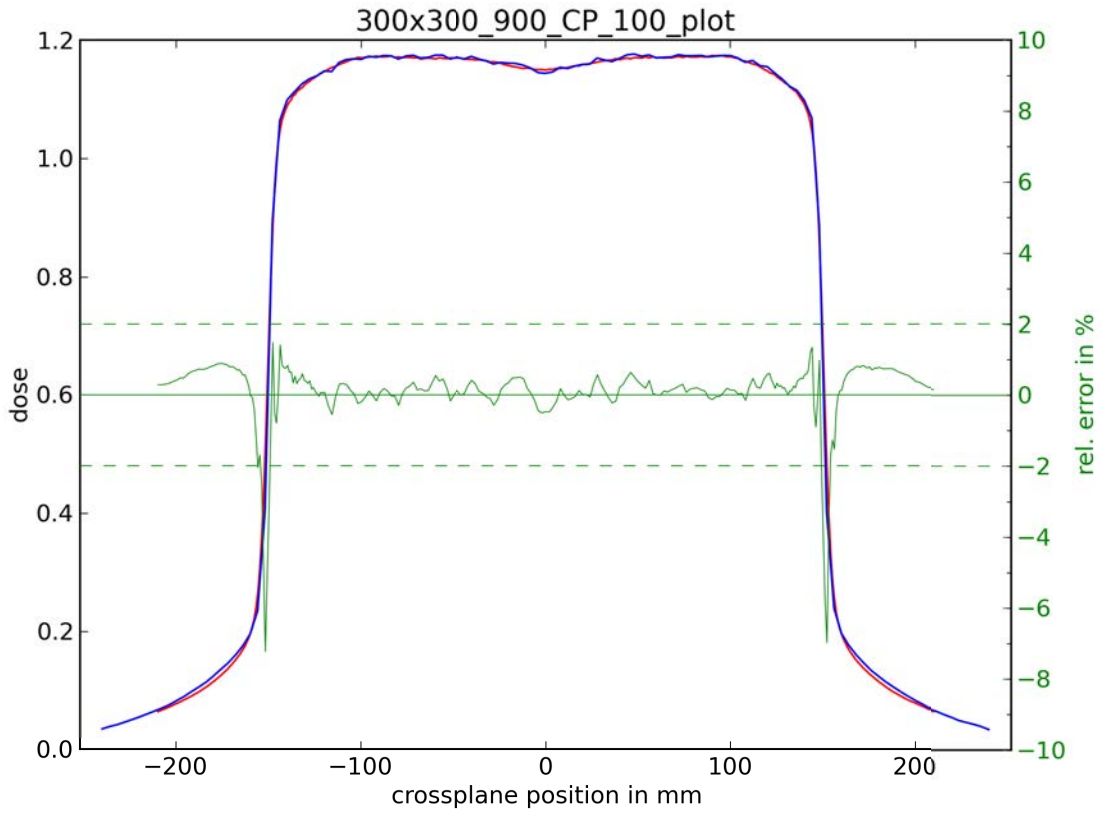
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 300x300 mm, depth 50 mm (PTW 31010 Semiflex)**



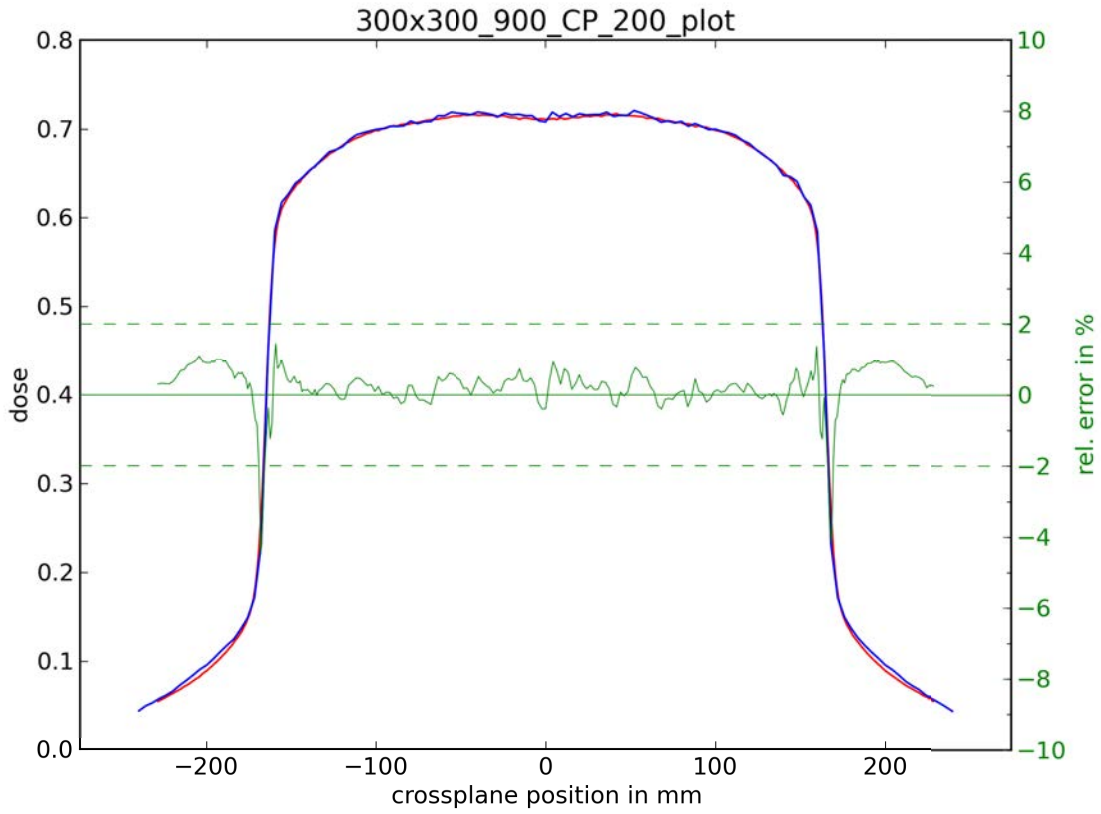
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 300x300 mm, depth 100 mm (PTW 31010 Semiflex)**



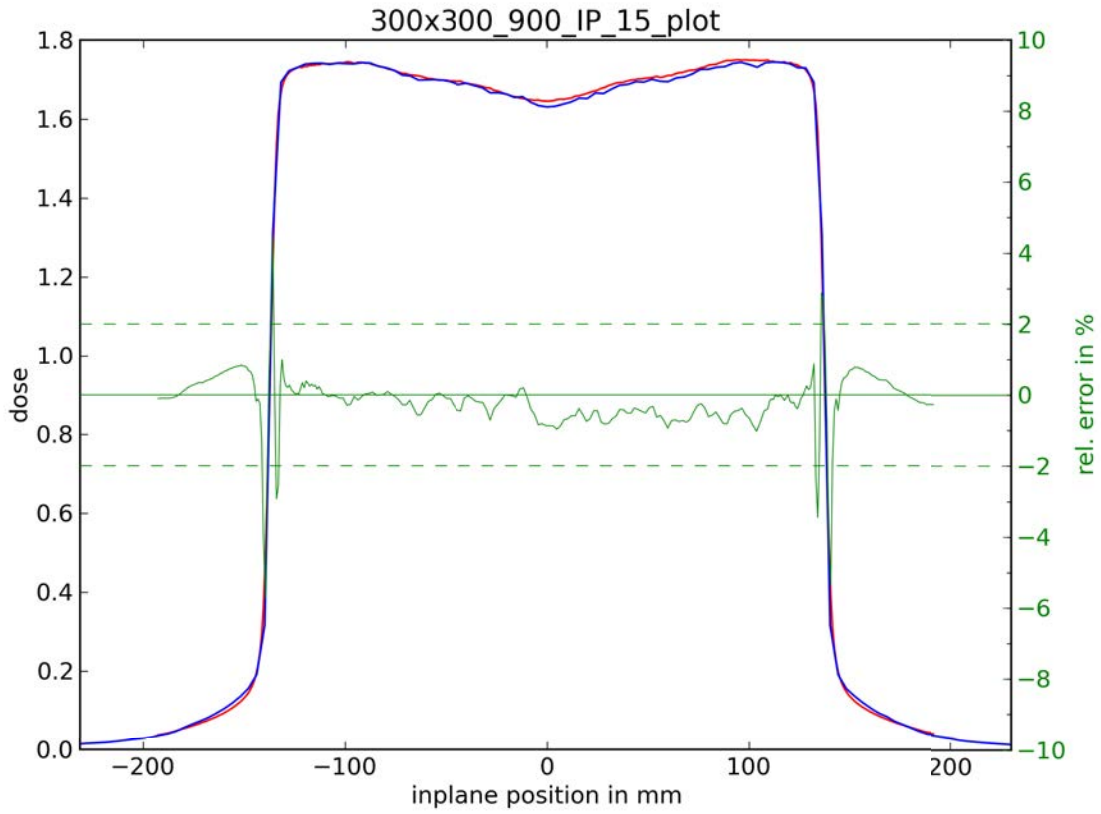
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 300x300 mm, depth 200 mm (PTW 31010 Semiflex)**



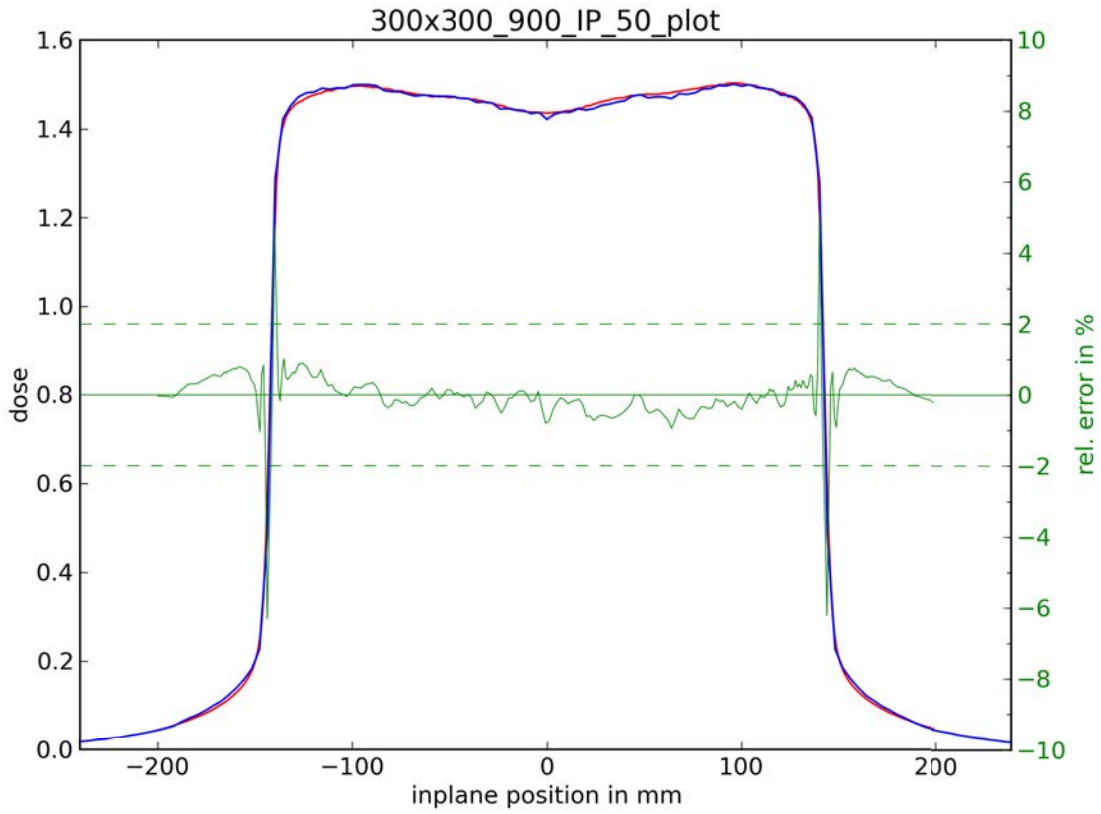
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 300x300 mm, depth 15 mm (PTW 31010 Semiflex)**



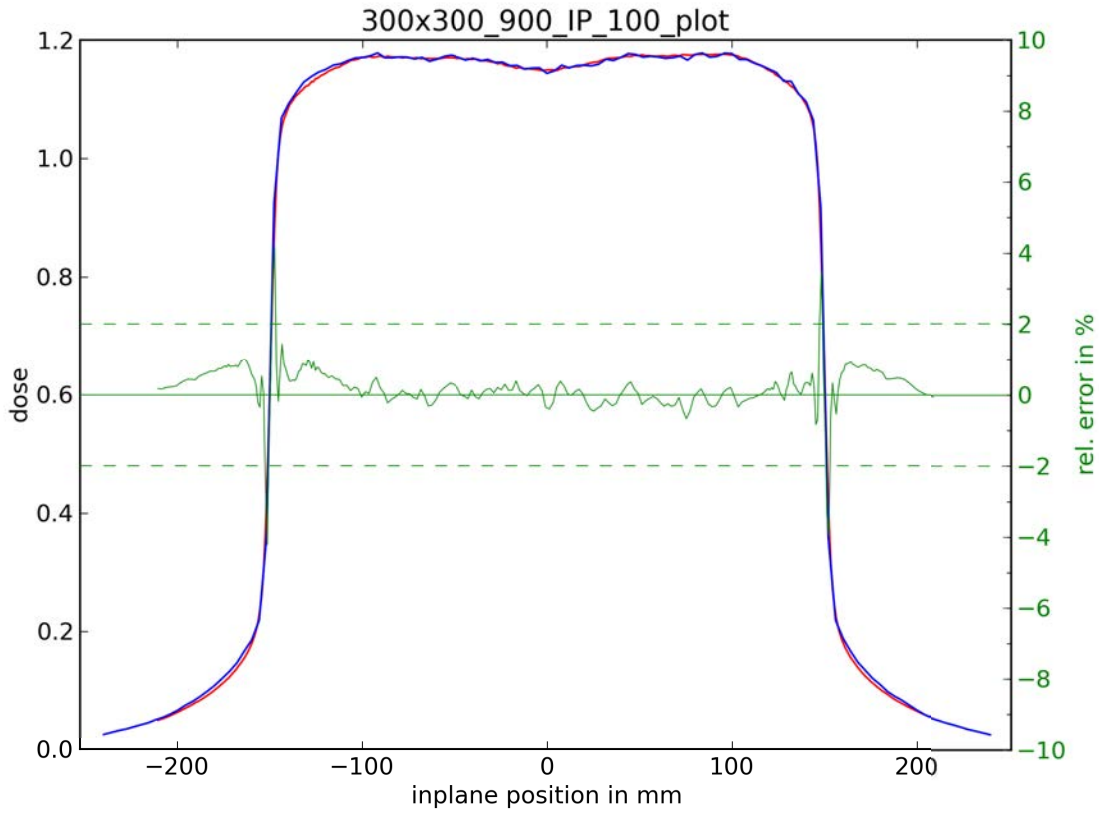
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 300x300 mm, depth 50 mm (PTW 31010 Semiflex)**



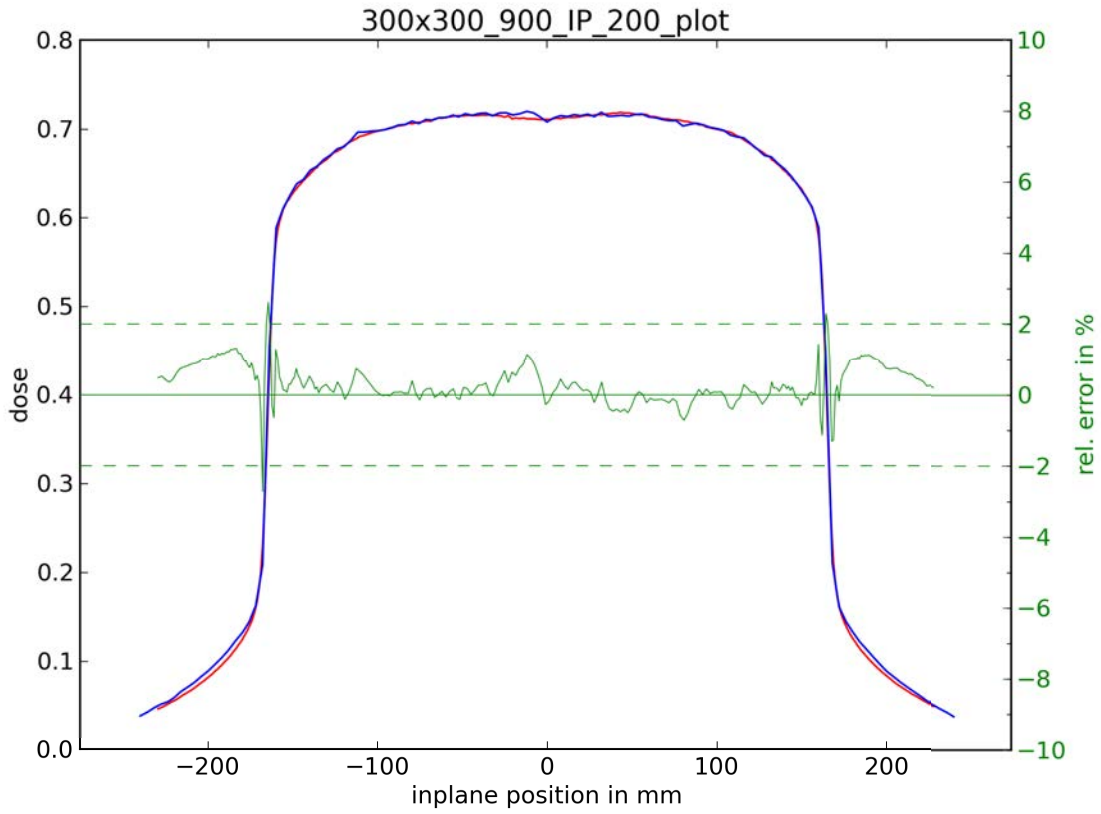
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 300x300 mm, depth 100 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

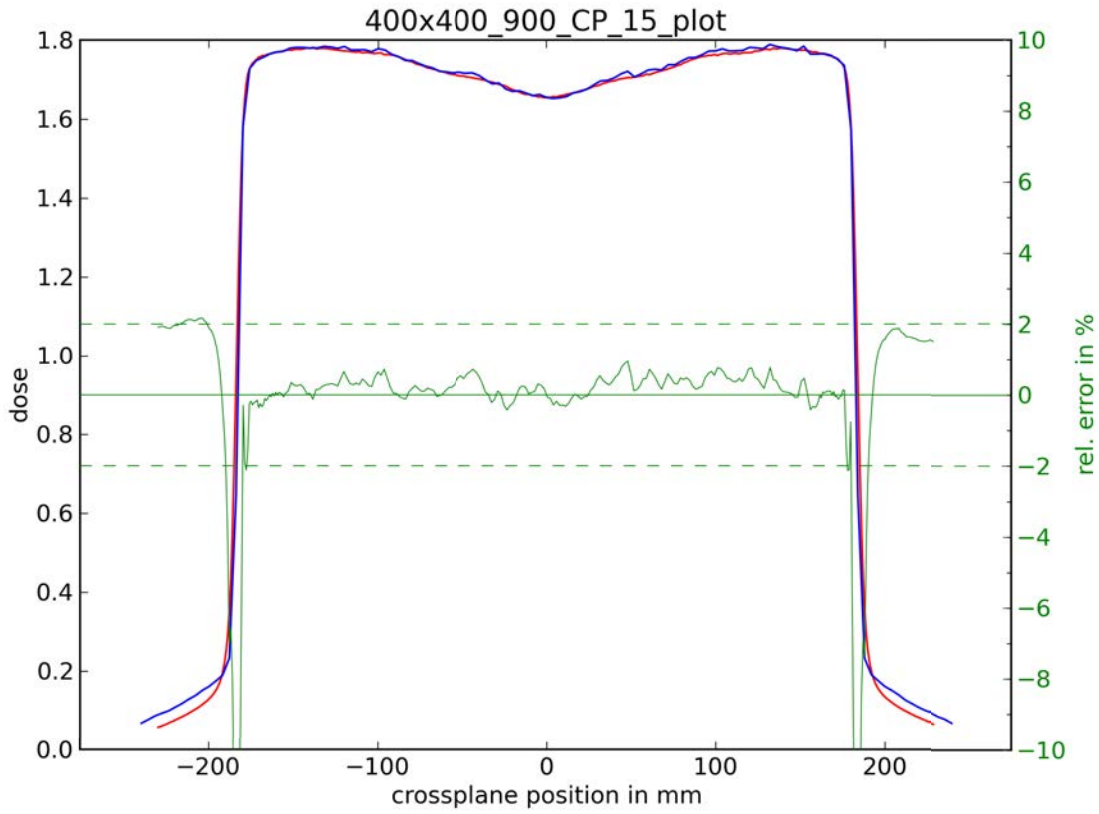
**INPLANE-Profiles: field size 300x300 mm, depth 200 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

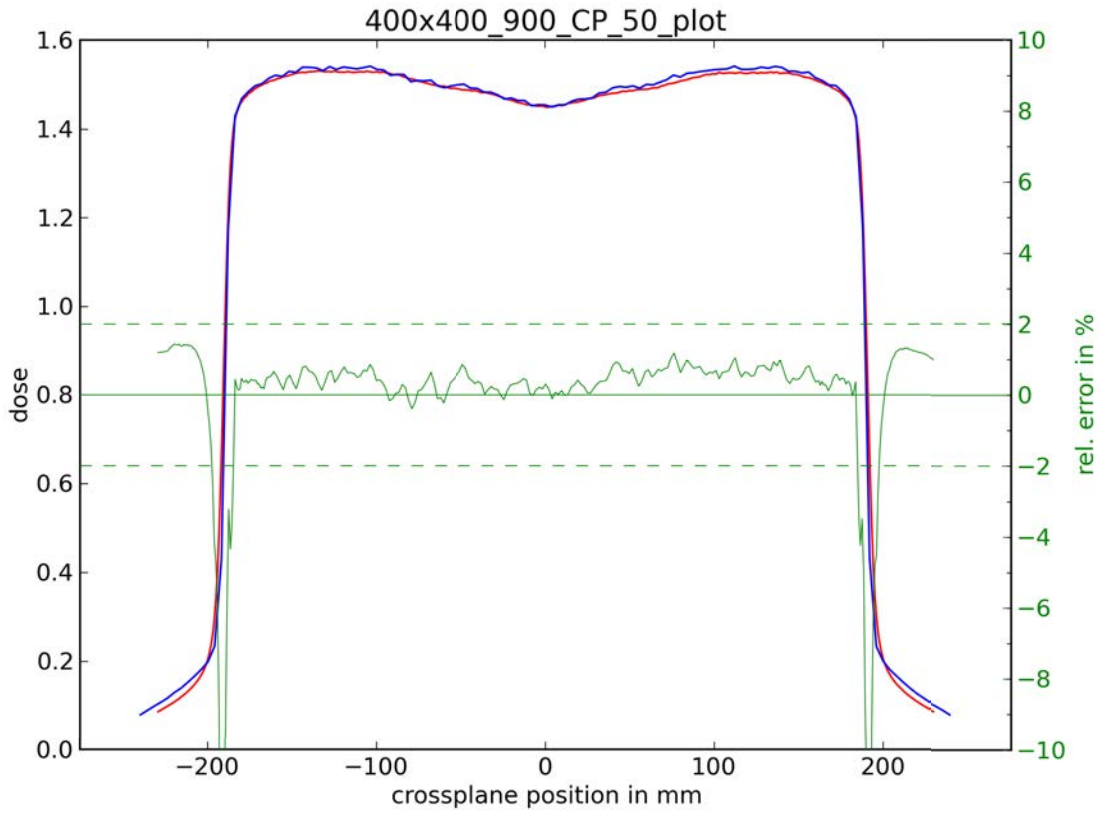


**CROSSPLANE-Profiles: field size 400x400 mm, depth 15 mm (PTW 31010 Semiflex)**



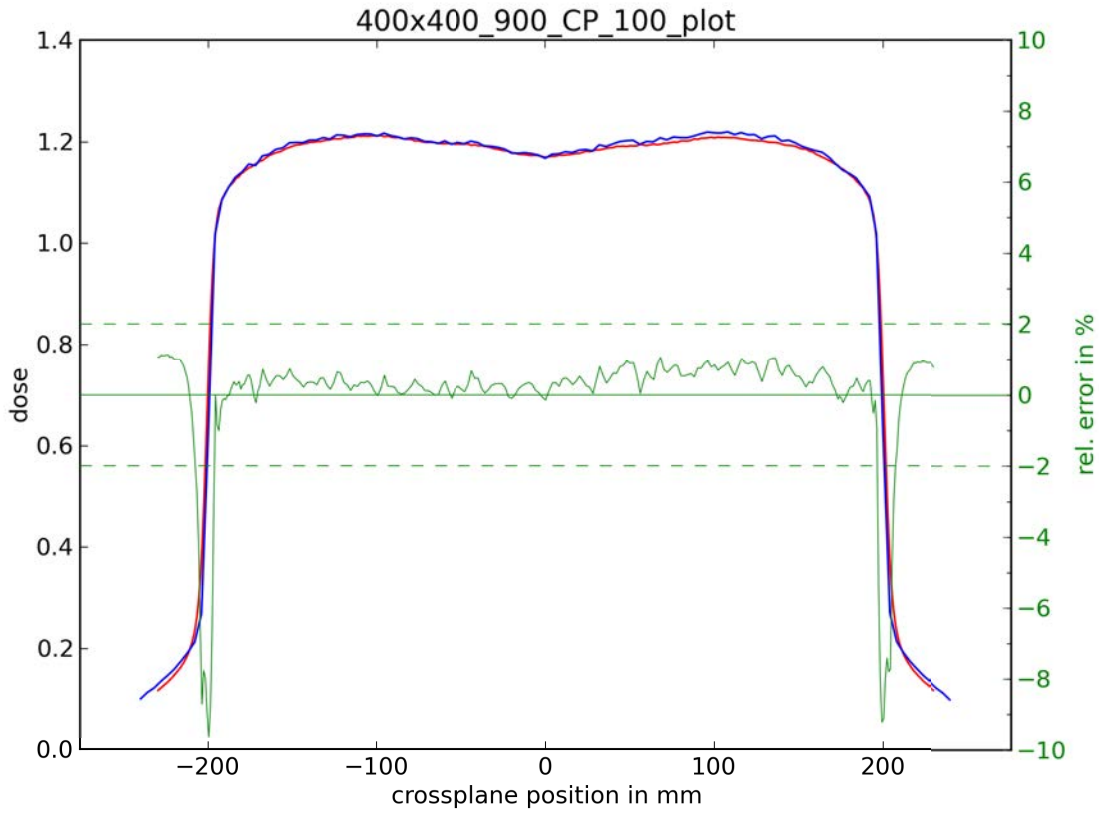
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 400x400 mm, depth 50 mm (PTW 31010 Semiflex)**



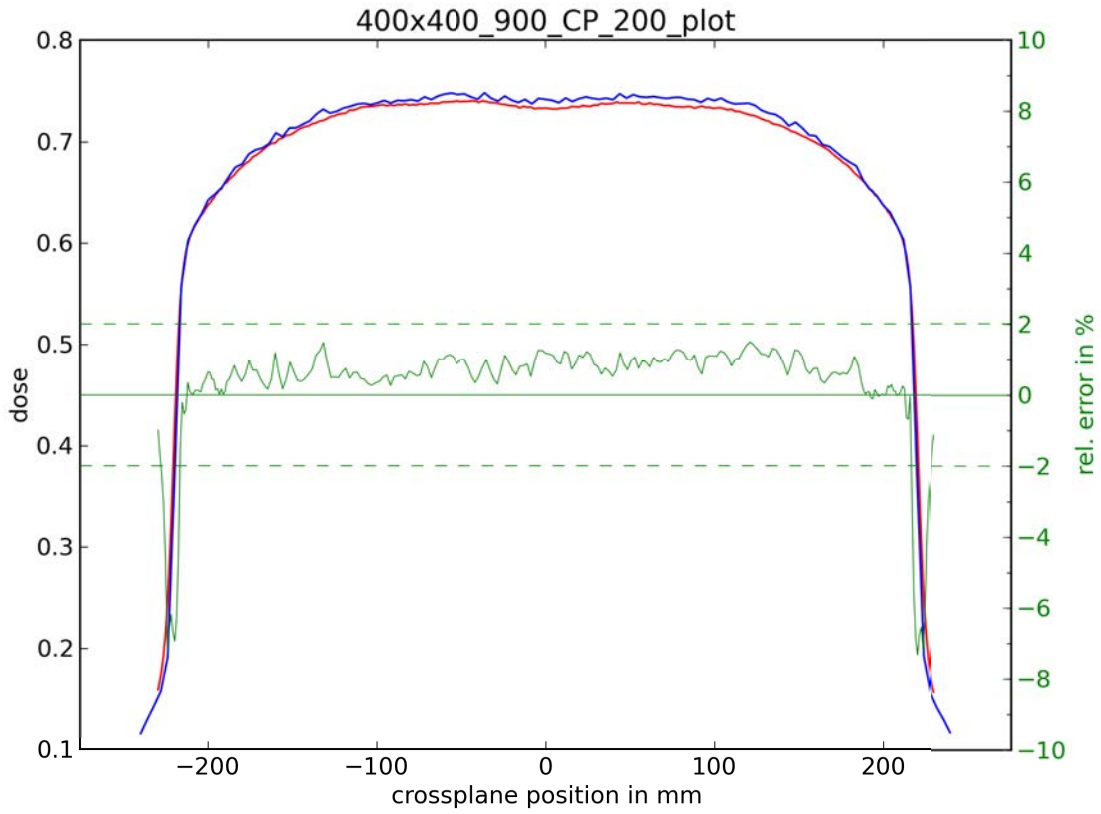
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 400x400 mm, depth 100 mm (PTW 31010 Semiflex)**



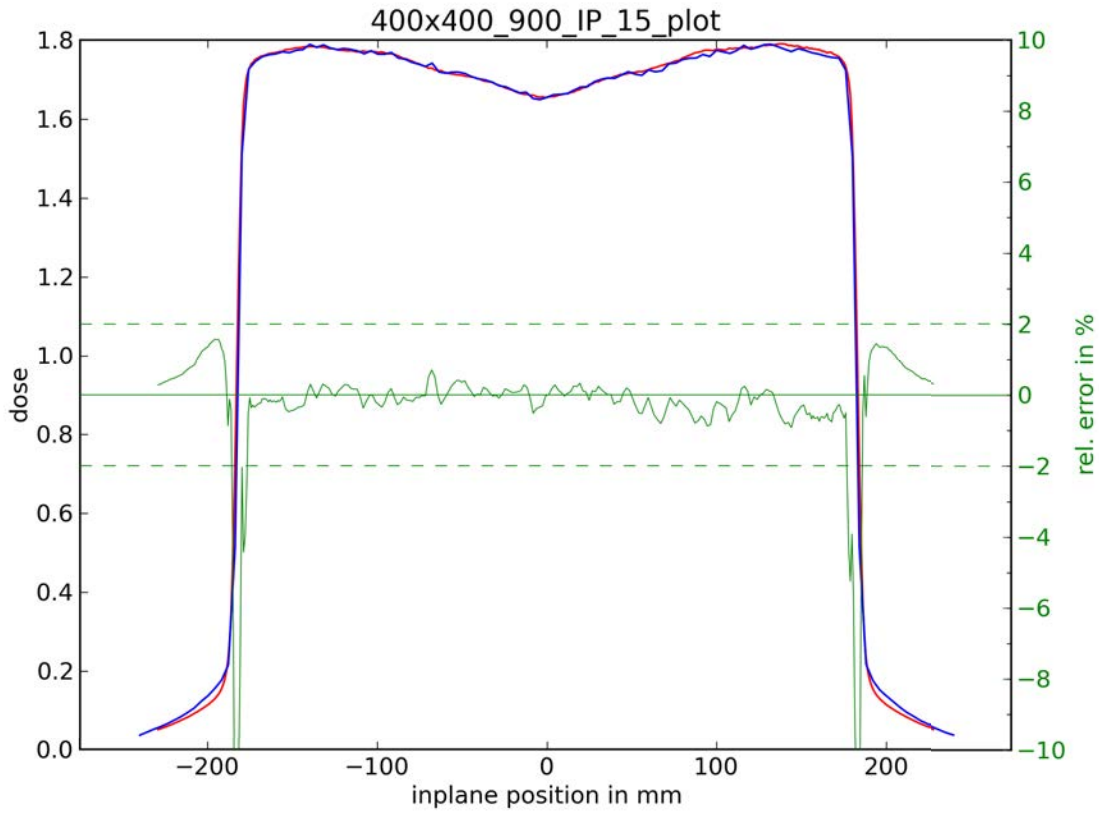
red: measurement; blue: simulation; green: rel. error

**CROSSPLANE-Profiles: field size 400x400 mm, depth 200 mm (PTW 31010 Semiflex)**



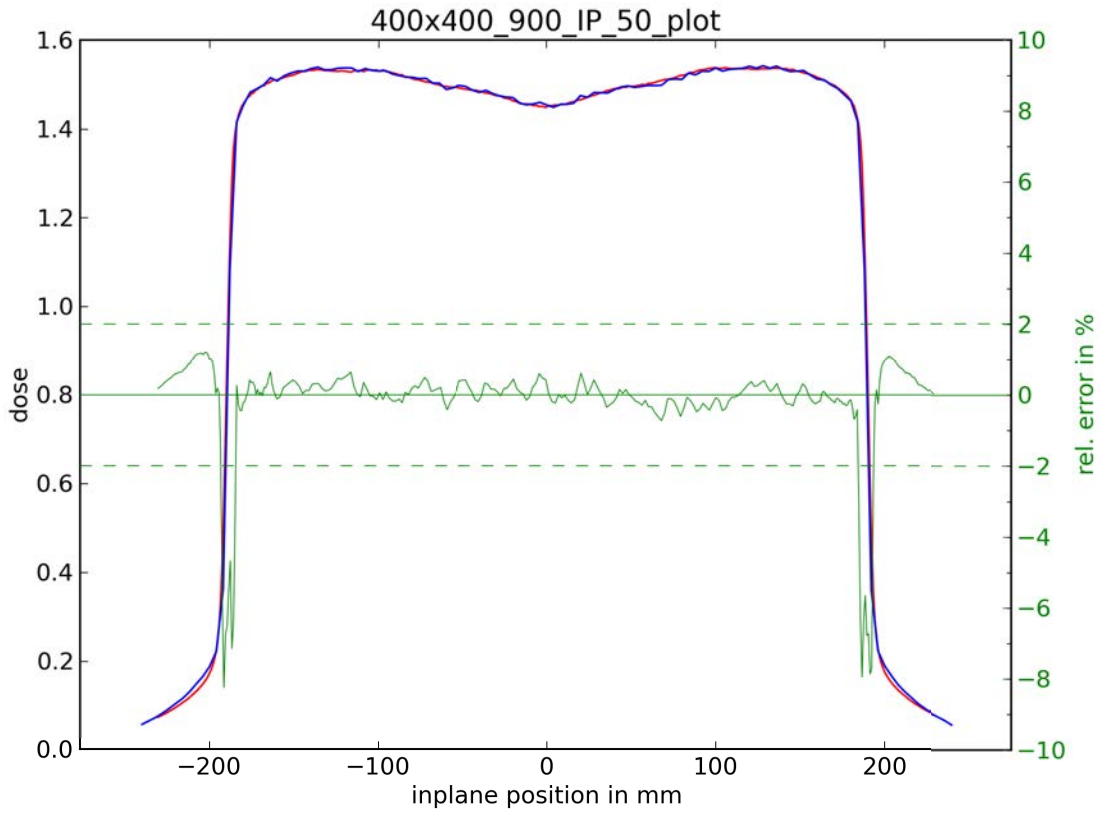
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 400x400 mm, depth 15 mm (PTW 31010 Semiflex)**



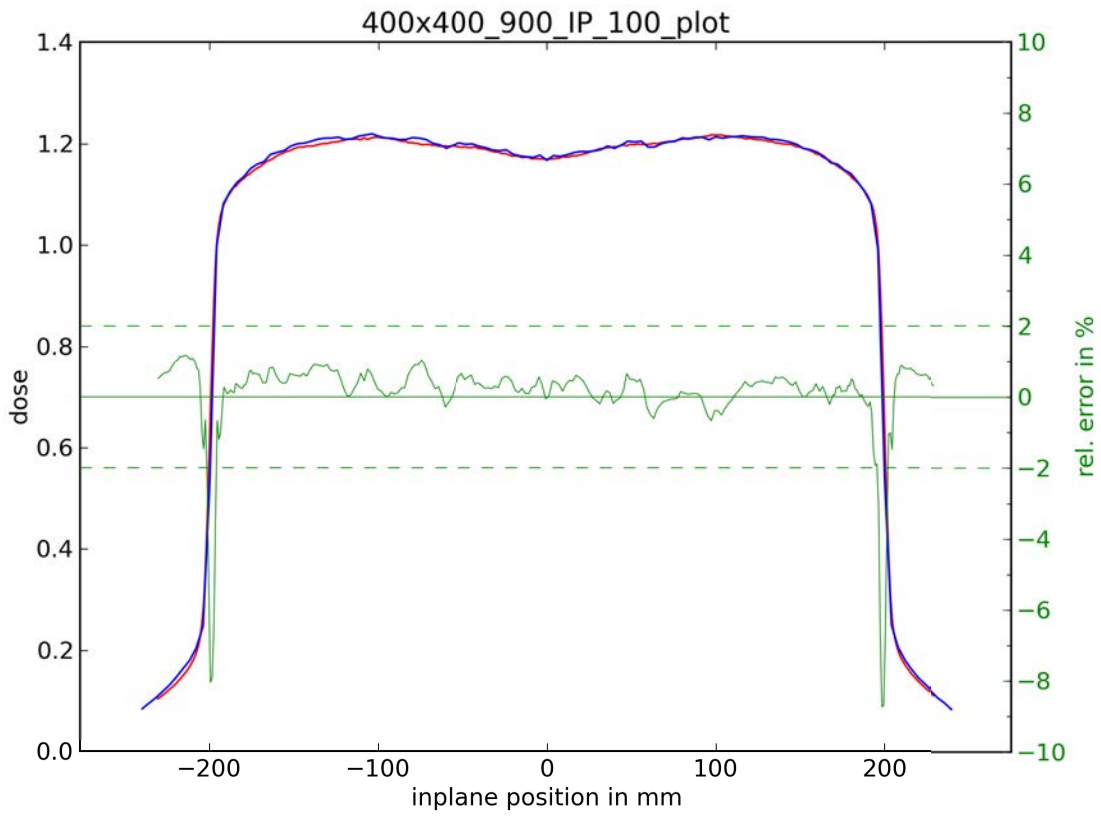
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 400x400 mm, depth 50 mm (PTW 31010 Semiflex)**



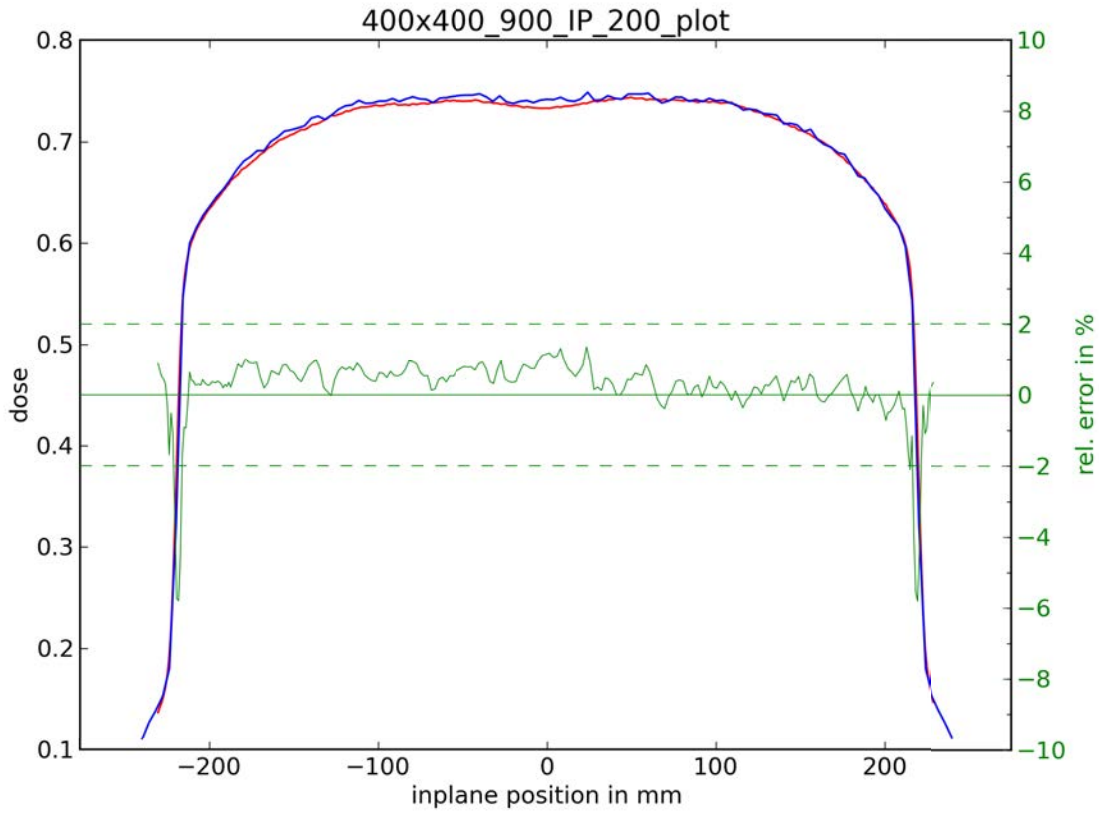
red: measurement; blue: simulation; green: rel. error

**INPLANE-Profiles: field size 400x400 mm, depth 100 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

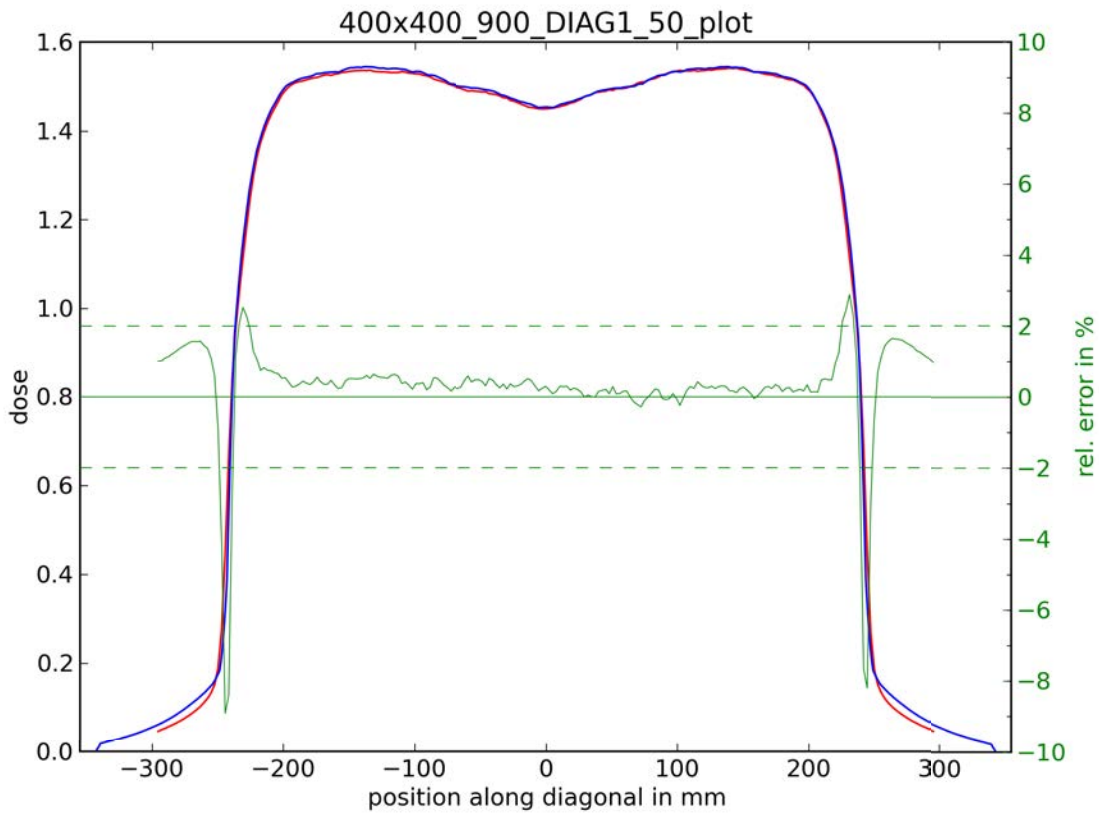
**INPLANE-Profiles: field size 400x400 mm, depth 200 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

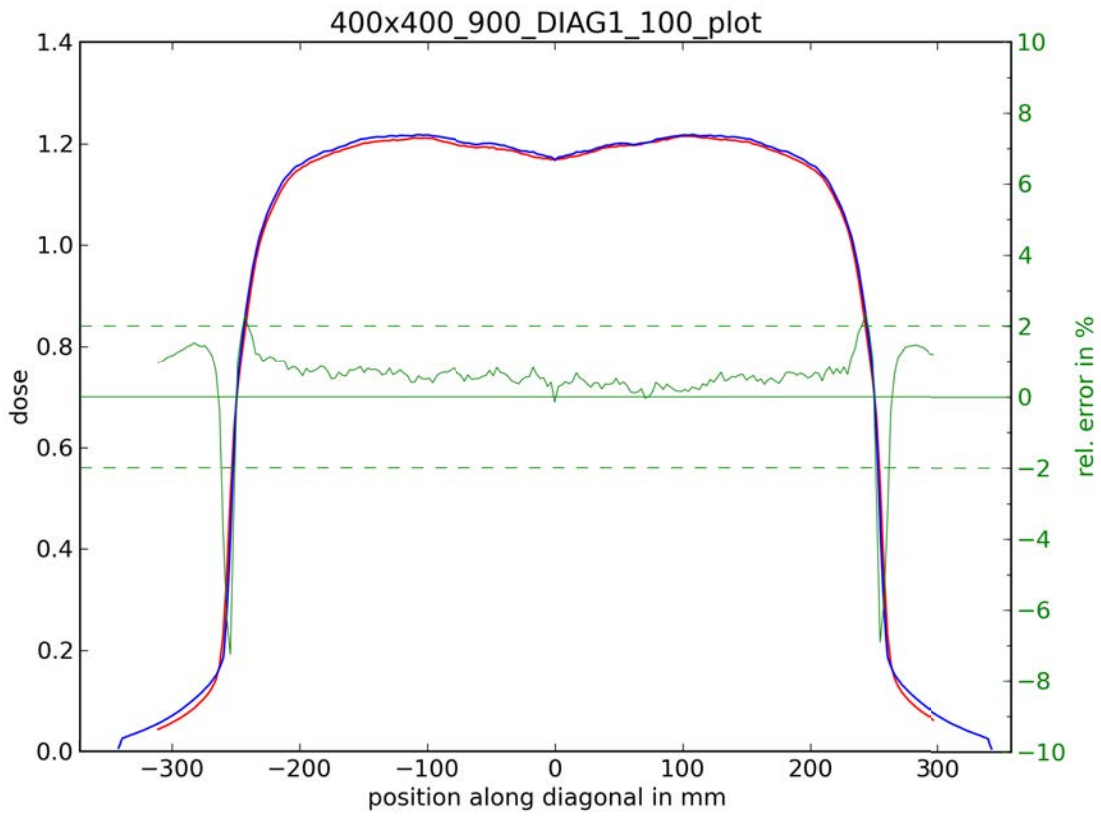


**DIAGONAL-Profiles: field size 400x400 mm, depth 50 mm (PTW 31010 Semiflex)**



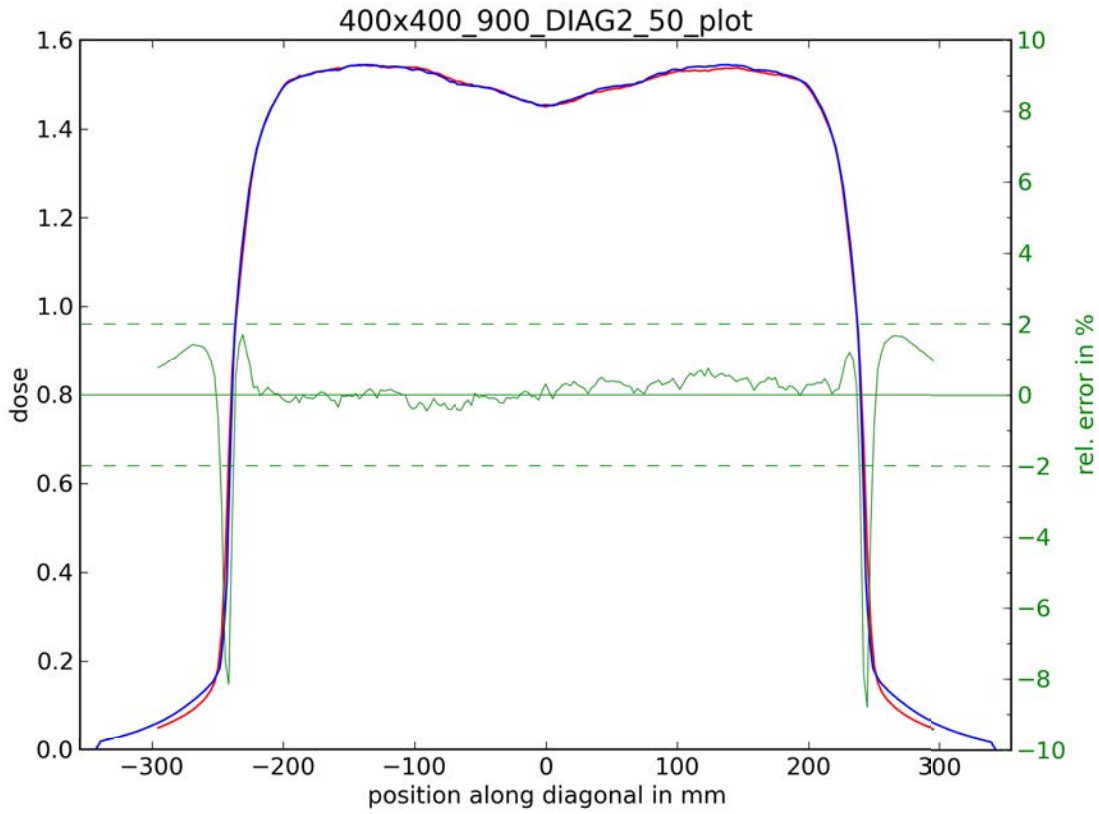
red: measurement; blue: simulation; green: rel. error

**DIAGONAL-Profiles: field size 400x400 mm, depth 100 mm (PTW 31010 Semiflex)**



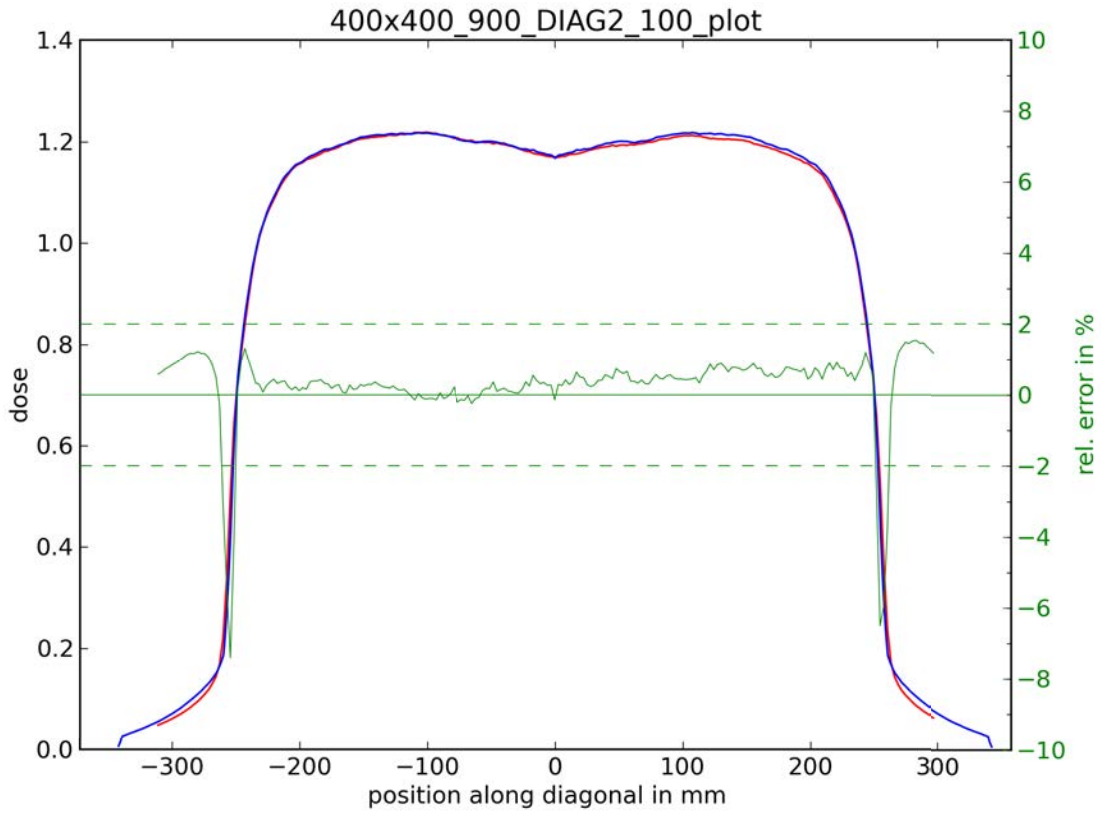
red: measurement; blue: simulation; green: rel. error

**DIAGONAL-Profiles: field size 400x400 mm, depth 50 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error

**DIAGONAL-Profiles: field size 400x400 mm, depth 100 mm (PTW 31010 Semiflex)**



red: measurement; blue: simulation; green: rel. error