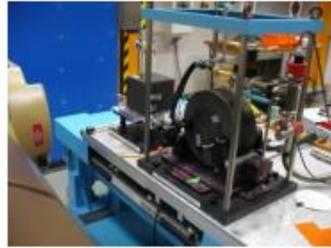# Intercomparison GUI user guide

Dosimetry chain to the clinic

NPL primary standard (Graphite calorimeter)

↓

NPL reference chambers

↓

UCLH secondary standard

↓

UCLH field chambers

↓

Monitor dosimetry from G1 to G4

Intercomparison is a process to derive the field chamber $^fN_{D,W}$ factor from our secondary standard chamber which has the $^{ss}N_{D,W}$ factor after calibrating with the NPL primary standard graphite calorimeter.

Output consistency

PostISM

Absorbed dose in water

Re-baseline our DQA3

Intercomparison GUI – from X drive

1.) You need to fill in every box, except Operator 2 and comment.

2.) Where do you want to save the intercomparison report. The input directory serves as the designated location for storing crash GUI input. If

3.) Blue: fetch NDW from proton database successfully. Red: use the hard-coded NDW. User has to double- check the NDW

4.) The GUI will automatically save GUI input to a csv after each 70 MeV entry

5.) hit "check data" to calculate fNDW + check all essential cells are filled

6.) hit "submit" to generate report

How it works

- Fill the table

Can be blank

How it works

- Click check data to calculate the "calc_fNDW"

- Warning message if calculated NDW exceeds two std

How it works ..

- Click submit if you are happy with your data
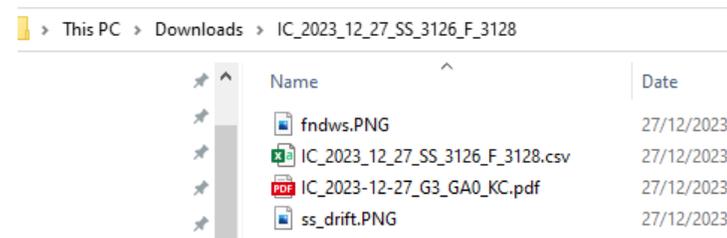
- An intercomparison report will be generated. (go through the report)

- Another GUI asks for pushing data to the database
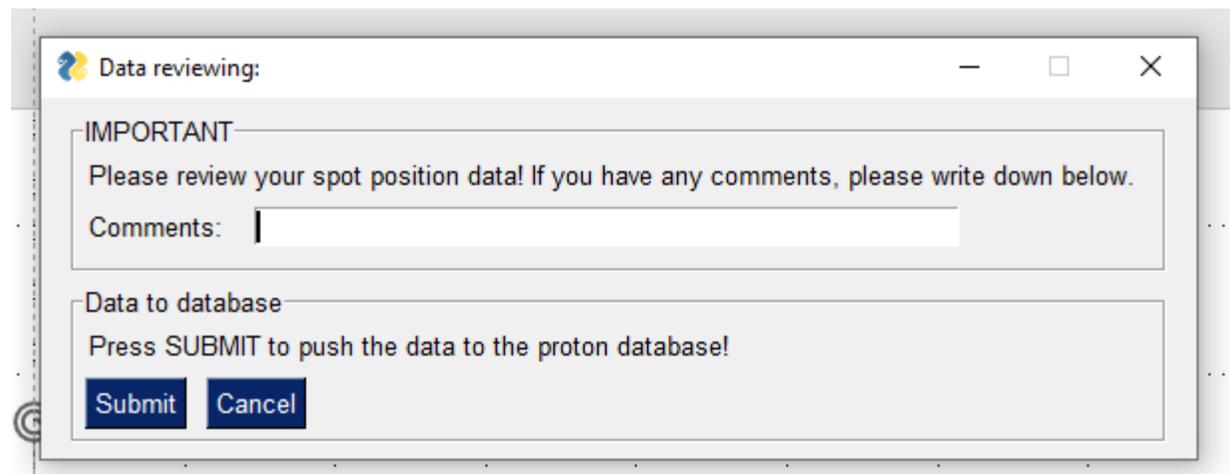
How it works

- MPE (Senior physicists) check the intercomparison

- Input the NDW factor to our Proton database (Calibration table)

Equipment	Cal Date	Operator	Signed off b	CalFactor	Kpol	Ref doc	Click to Add
Roos electron chamber 0.35 cc, [3126]	26/04/2019	AW		85070000	1	NPL cert 2019	
Roos electron chamber 0.35 cc, [3126]	13/05/2021	AW		84800000	1	NPL cert 2021	
Roos electron chamber 0.35 cc, [3126]	04/10/2023	AW	AW	84700000	1	NPL cert 2023	
Roos electron chamber 0.35 cc, [3128]	09/11/2019	AW		83790123	1	Roos comm ch	
Roos electron chamber 0.35 cc, [3128]	18/07/2021	SavC	AW	83590000	1	PBTPhysicsTea	
Roos electron chamber 0.35 cc, [3128]	24/10/2023	SavC	AW	83200000	1	SP QA I MO23	
Roos electron chamber 0.35 cc, [3131]	09/11/2019	AW		83402601	1	Roos comm ch	
Roos electron chamber 0.35 cc, [3131]	13/05/2021	AW		83300000	1	NPL cert 2021	
Roos electron chamber 0.35 cc, [3131]	24/10/2023	SavC	AW	82900000	1	SP QA I MO23	
Roos electron chamber 0.35 cc, [3132]	09/11/2019	AW		83842813	1	Roos comm ch	
Roos electron chamber 0.35 cc, [3132]	13/05/2021	AW		83700000	1	NPL cert 2021	
Roos electron chamber 0.35 cc, [3132]	04/10/2023	AW	AW	83600000	1	NPL cert 2023	
Roos electron chamber 0.35 cc, [3128]	06/06/2021	AGr	AW	83585563	1	PBTPhysicsTea	

Auto-saved csv

Report location:

[   ] Browse

- After each 70 MeV beam entry, the code will auto save the GUI input as an csv. If the GUI crashes for whatever reason, all you need is to load csv.
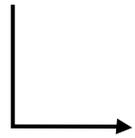
4.) The GUI will automatically save GUI input to a csv after each 70 MeV entry

CSV location:

[   ] Browse   Load CSV

- If you do not input "Report location", the report + csv will be saved in your "Downloads" folder.
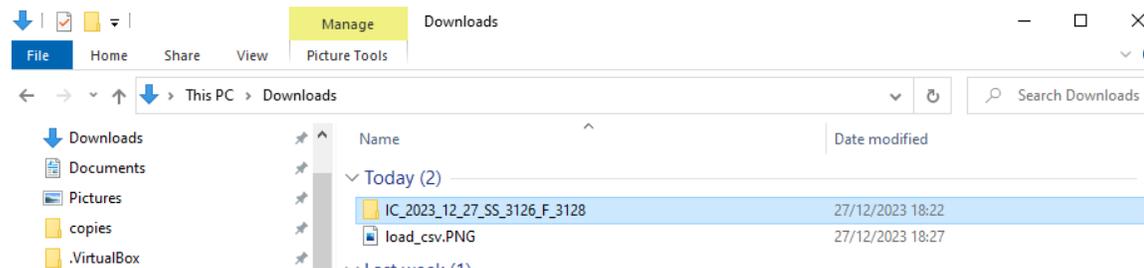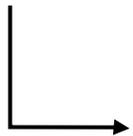
Frozen intercomparison GUI...

- Check the memory left for your PC

- Free up space from your proton and person OneDrive
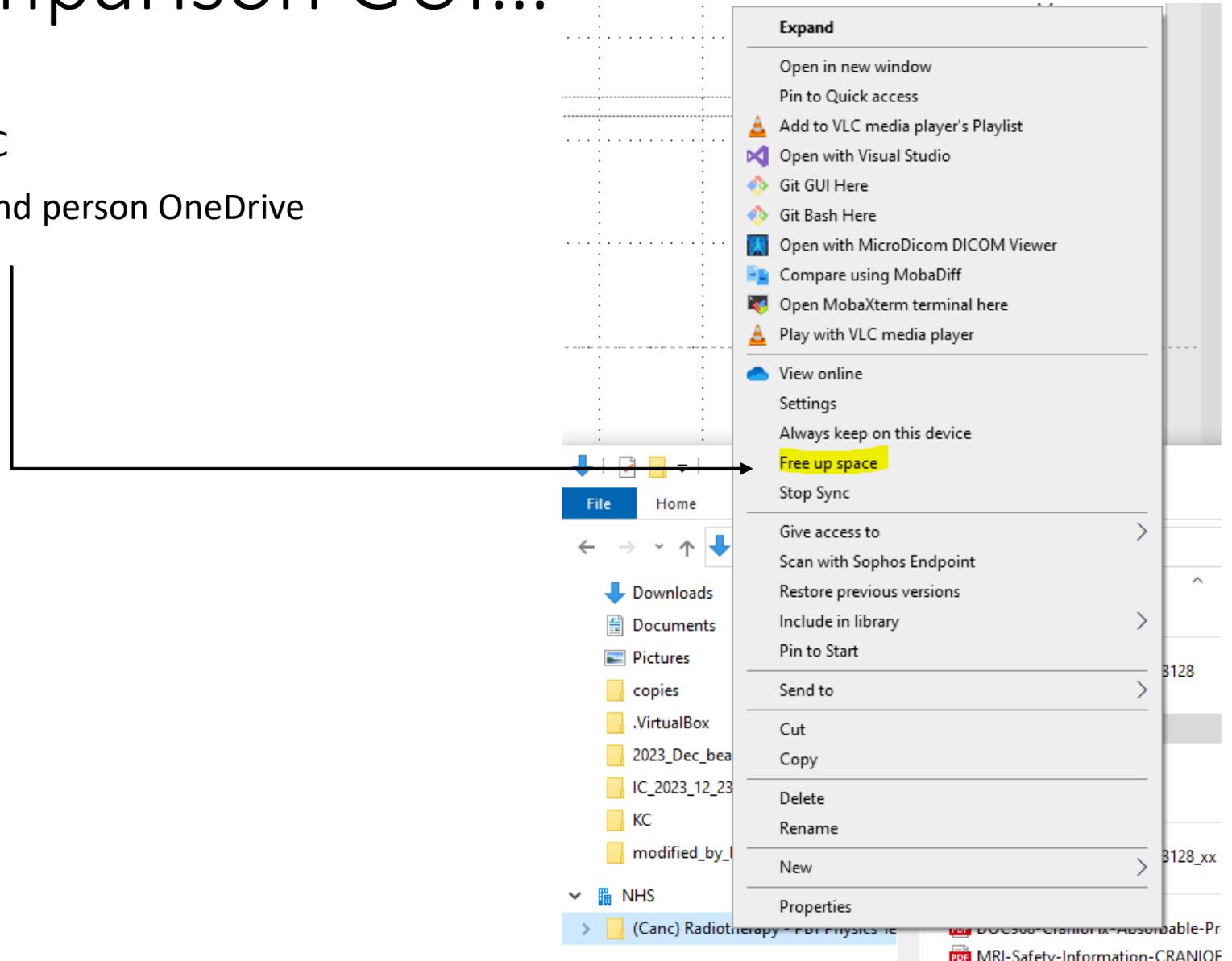
NDW factors comes from the proton database or hard-coded number?

- Blue text colour: Successfully fetched NDW from database

---ss NDW calibration factor---
NDW factor successfully fetched from database.

ssNDW: [　　　]　　previous_fNDV [　　　]　　calc_fNDW: [　　　]

- Red text: Used hard-coded NDW

---ss NDW calibration factor---
Unable to fetch NDW factor from database. PLEASE check the chamber specific NDW factor on iPASSPORT.

ssNDW: [　　　]　　previous_fNDV [　　　]　　calc_fNDW: [　　　]

- Fetching status is highlighted in intercomparison report

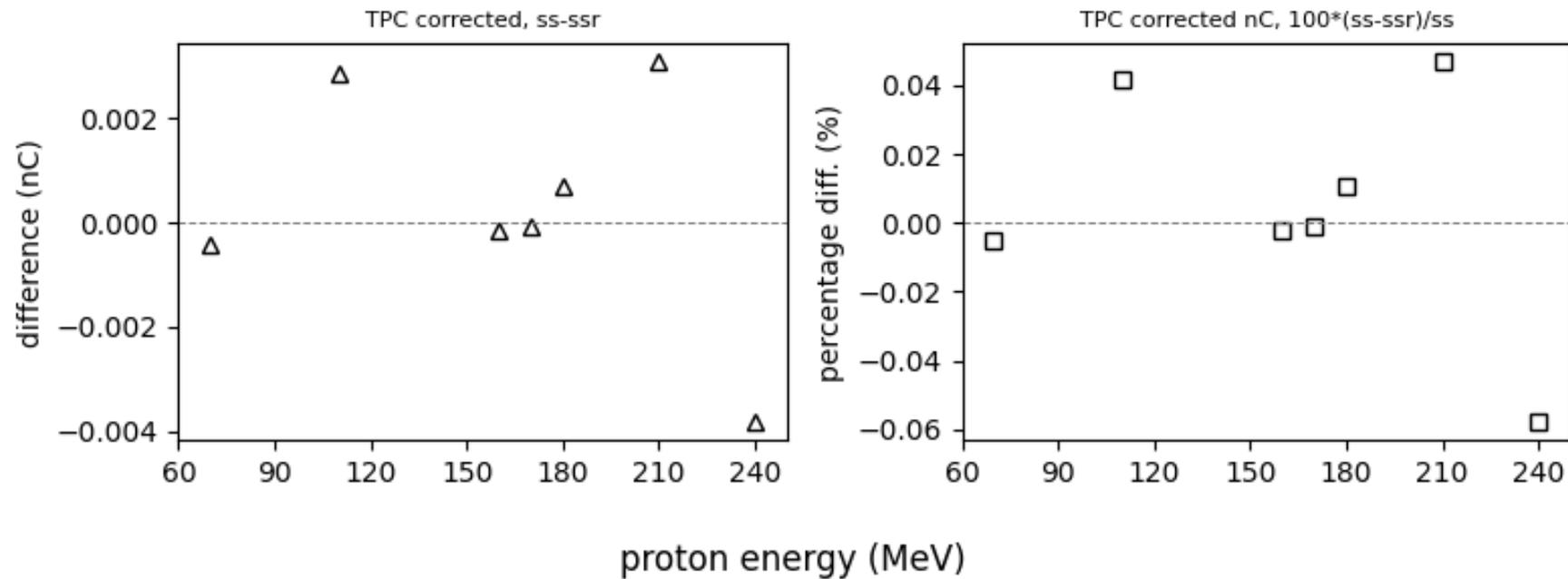**3128 intercomparison report**

Date: 2023-12-27 18:21:54

Gantry:3

Gantry angle: 0

Operator(s): KC

Material: solid water (RW3)

Humidity: 50.2

Comment:

Summary:

- NDW factor successfully fetched from database.

$$N_{D,W}\ (f) = N_{D,W}(ss) \cdot \frac{mR_{ss}}{mR_f} \qquad (1)$$

Data quality assessment – any drifts?

- 5 ss measurements
- 3 ssr measurements

Data quality assessment – 2 std

- Calculate mean and σ from field chamber NDW from 240 MeV, 210 MeV, 180 MeV, 170 MeV, 160 MeV, 110 MeV, 70 MeV

- Measurements should be within mean ±2 σ

- ±2 σ is a in-house tolerance (aims to flag errors in the early stage of measurements)

- There is no tolerance (maybe, not that I am aware of) on the NDW factor obtained by intercomparison
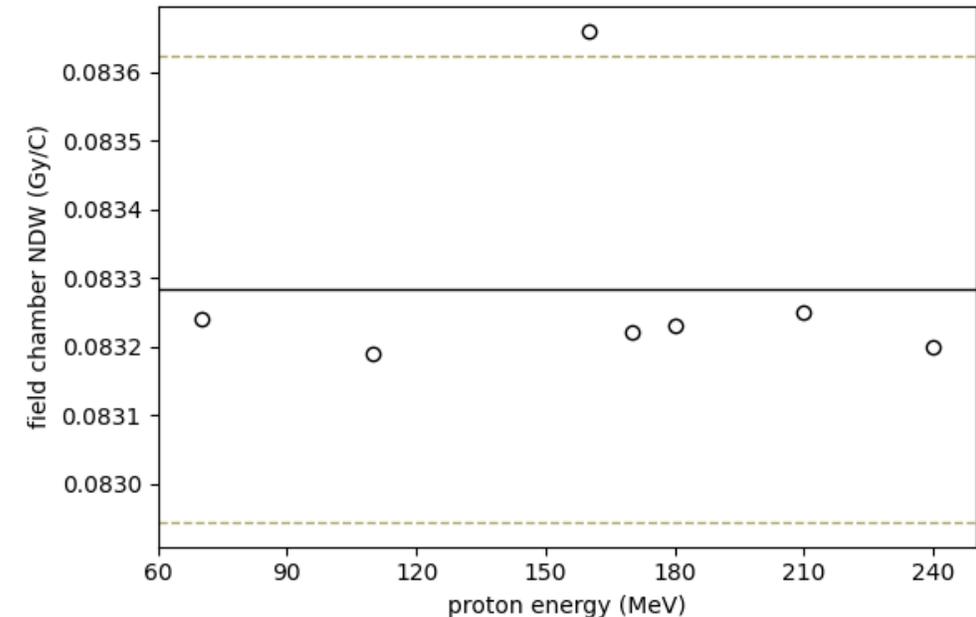
Data quality assessment – 2 std

- **Limitations**
    1. Fails to flag error if I mess up numbers from two energies as the mean and σ are likely to be affected.
    2. G4 110 MeV output could fluctuate > potentially exceed ±2 σ >> should we care?
    3. 1σ of fNDW could be very small (i.e. 0.00017 a.u. while mean = 0.08328 Gy/C)

        1 σ could be 0.2% of the mean. NPL reports NDW with 4 decimal place (i.e. 0.0847 Gy/C for 3126)

        >> it seems to me G4 data has higher std and G180 MeV exceed 2 std. what shall we do for it?