

# TOPAS-nBio (TOPAS v3.5)

## Regression testing (cf. TOPAS-nBio (TOPAS v3.4))

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DBSCAN

G-value: step-by-step

G-value: IRT

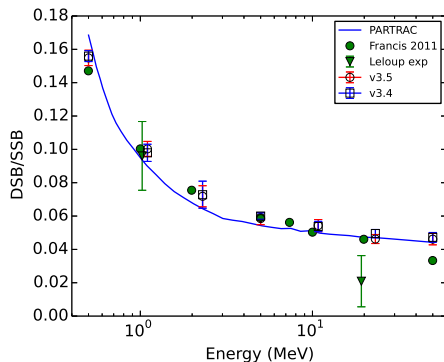
LET

Nanodosimetry I

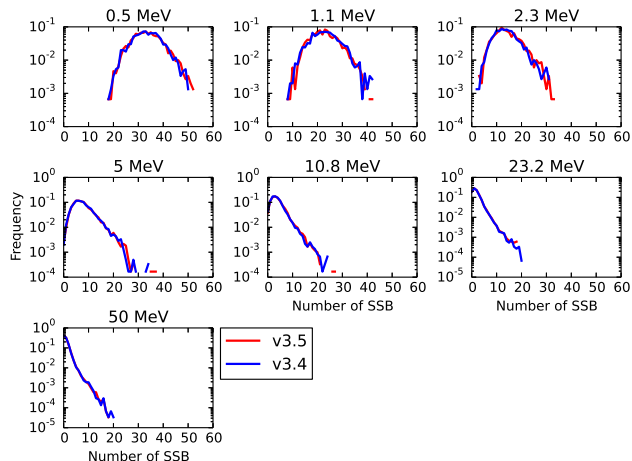
Nanodosimetry II

Nanodosimetry III

# DBSCAN

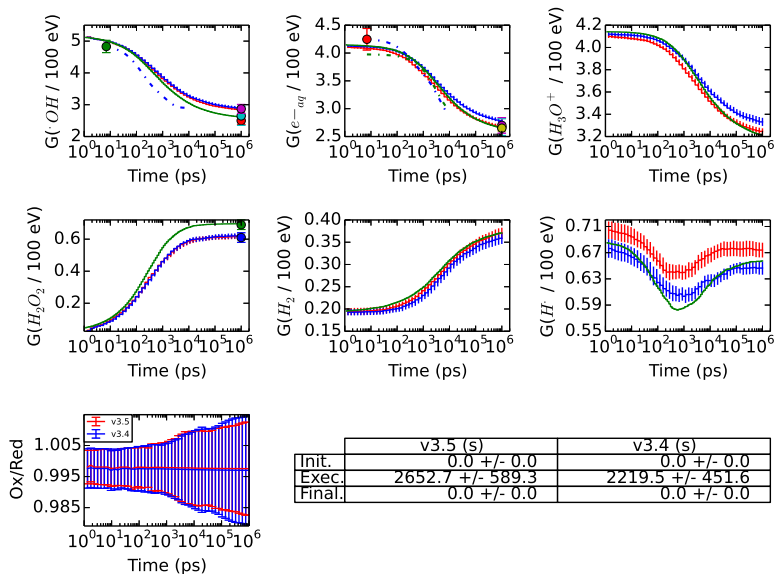


	v3.5 (s)	v3.4 (s)
Init.	0.0 +/- 0.0	0.0 +/- 0.0
Exec.	503.5 +/- 13.1	498.7 +/- 15.4
Final.	0.0 +/- 0.0	0.0 +/- 0.0



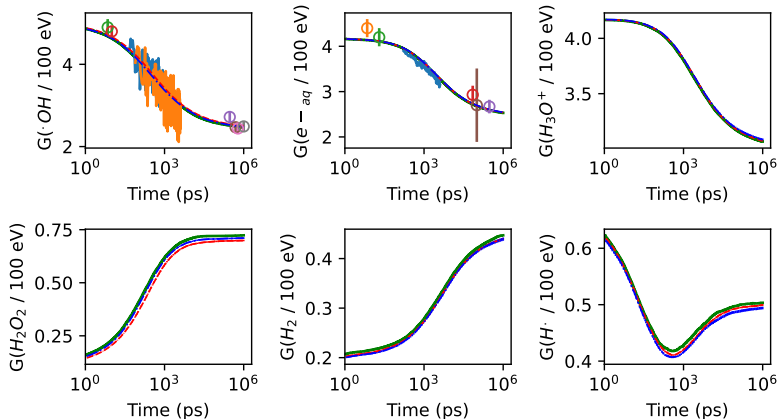
- Francis Z, Villagrasa C, Clairand I. Simulation of DNA damage clustering after proton irradiation using an adapted DBSCAN algorithm. *Comput Methods Programs Biomed.* 2011; 101(3):265-270. doi:10.1016/j.cmpb.2010.12.012

# G-value: step-by-step



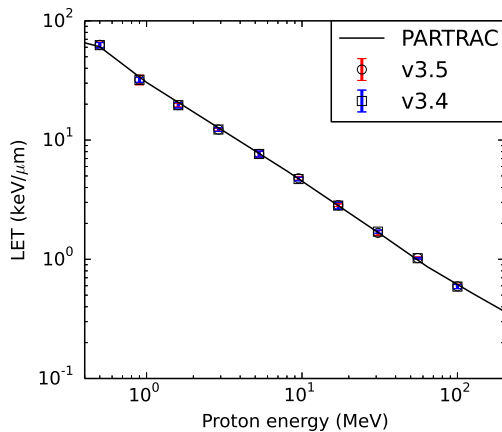
Wang F, Schmidhammer U, Larbre JP, Zong Z, Marignier JL, Mostafavi M. Time-dependent yield of the hydrated electron and the hydroxyl radical in  $D_2O$ : A picosecond pulse radiolysis study. Phys Chem Chem Phys. 2018;20(23):15671-15679. doi:10.1039/c8cp02276c

# G-value: IRT



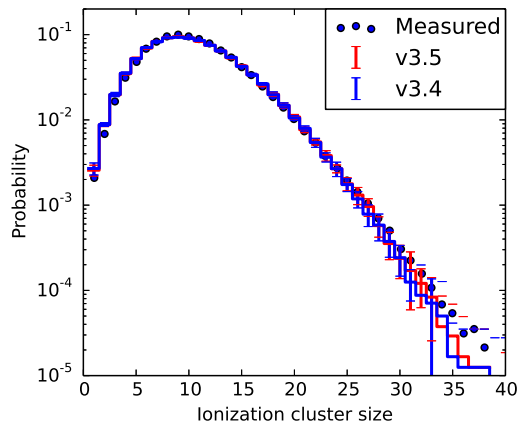
	TOPAS under test (s)	TOPAS benchmark (s)
Init.	0.020 +/- 0.000	0.022 +/- 0.004
Exec.	97.696 +/- 11.772	23.494 +/- 1.736
Final.	0.015 +/- 0.005	0.010 +/- 0.000

# LET



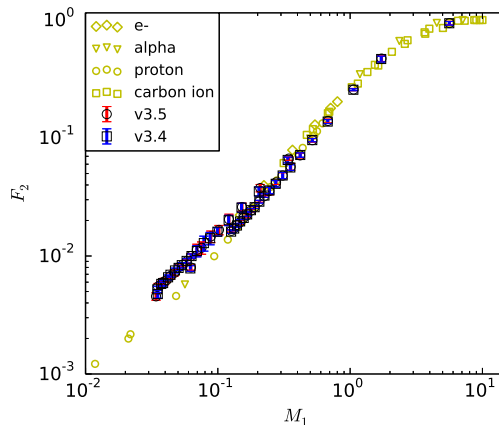
	v3.5 (s)	v3.4 (s)
Init.	0.0 +/- 0.0	0.0 +/- 0.0
Exec.	896.2 +/- 25.1	889.5 +/- 41.2
Final.	0.0 +/- 0.0	0.0 +/- 0.0

# Nanodosimetry I



	v3.5 (s)	v3.4 (s)
Init.	0.0 +/- 0.0	0.0 +/- 0.0
Exec.	7530.5 +/- 99.7	7347.6 +/- 75.4
Final.	0.0 +/- 0.0	0.0 +/- 0.0

# Nanodosimetry II

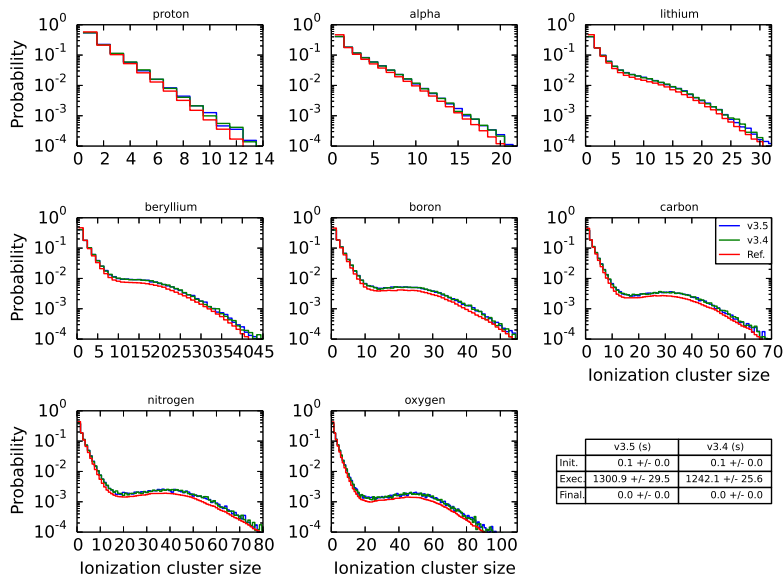


	v3.5 (s)	v3.4 (s)
Init.	0.0 +/- 0.0	0.0 +/- 0.0
Exec.	912.9 +/- 5.3	896.9 +/- 10.8
Final.	0.0 +/- 0.0	0.0 +/- 0.0





# Nanodosimetry III



Ramos-Méndez J, Burigo LN, Schulte R, Chuang C, Faddegon B. Fast calculation of nanodosimetric quantities in treatment planning of proton and ion therapy. *Phys Med Biol.* 2018;63(23):235015. doi:10.1088/1361-6560/aaeeee