

Accuracy. Ensured.

**Monte Carlo Secondary Dose Check and
Plan QA with SciMoCa™**

PROTECT +
ENHANCE +
SAVE LIVES

DISCOVER SCIMOCA™

Discover the power of Monte Carlo accuracy for secondary dose check and plan QA.

What is SciMoCa? How will it improve daily QA work?

SciMoCa establishes a new standard for accuracy in secondary dose check and independent plan QA. SciMoCa is powered by the accuracy of Monte Carlo dose calculations. It identifies TPS dose errors and discrepancies with minimal effort, and provides instantaneous feedback regarding treatment plan quality and achievement of planning objectives. SciMoCa utilizes a best-in-class Monte Carlo dose calculation algorithm with an outstanding academic pedigree to assure the quality of your QA. Enhance the quality of your treatment planning and patient QA with the accuracy of Monte Carlo.

Accuracy

SciMoCa achieves an accuracy of < 1% ** and matches the precision of such top-tier algorithms as Varian's Acuros® and Accuray's Precision® Monte Carlo. The Monte Carlo calculation provides dose to medium and dose to water.

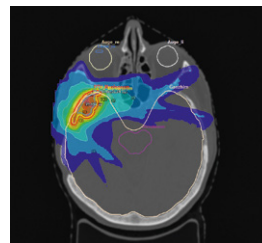
This accuracy is achieved due to the quality of this Monte Carlo implementation in addition to a custom machine-specific Linac beam model. This model is generated for the customer using proprietary processes and dedicated expert tools, backed by extensive expertise.

Monte Carlo. Unlimited.

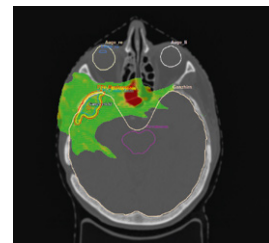
SciMoCa supports all Elekta™, all Siemens, all Varian LINACs [except Halcyon™] and CyberKnife®. TomoTherapy® will be supported soon.*

SciMoCa supports all treatment planning systems that provide DICOM export.

Supported treatment techniques are 3D, IMRT, VMAT, SBRT, SRS – [MLC-shaped photons], CyberKnife® cones, Iris, and MLC.



Accuray InCise2™ CyberKnife® dose distribution by SciMoCa



SciMoCa compared against Accuray Precision 1.0 [Monte Carlo], Gamma analysis 1%/1mm

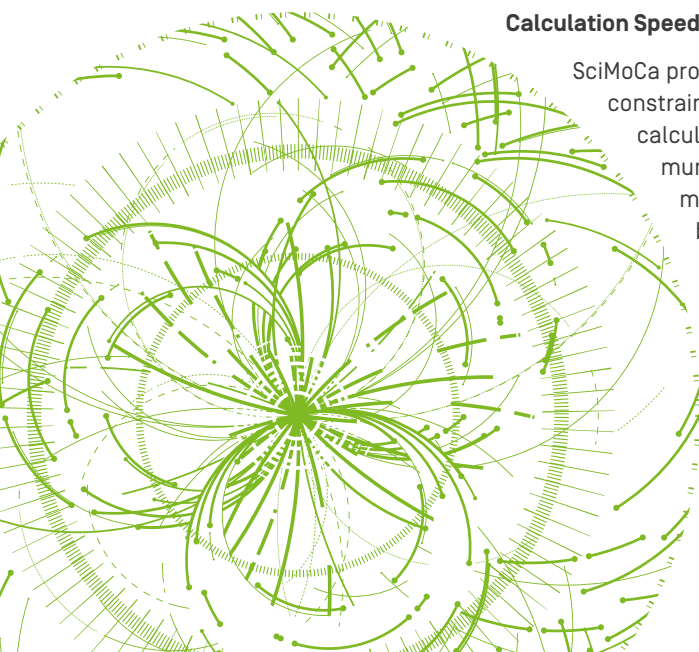
Calculation Speed

SciMoCa provides the full overview whether the treatment plan is within constraints or not. The speed of the Monte Carlo engine for full 3D dose calculations is truly impressive because the algorithm makes optimum use of modern hardware architecture. The outstanding performance is enabled through the fast dose engine, calculation in the background, and the automation of the workflow.

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*Not available for sale



Automated Workflow — Application Simplicity — Quality Outcome

Patient Name	Plans	Last Updated*	Date Received	Status	Tools
HN VMAT pt4	1	07/09/2018 9:08 AM	06/02/2018 4:04 PM	Approved	
lungCKFC_pat5	1	06/25/2018 9:59 AM	06/02/2018 4:03 PM	Pending	
prostateCKQ2_pat1	1	06/04/2018 8:21 AM	06/02/2018 4:03 PM	Pending	
+ prostate_pat1	3	06/02/2018 4:53 PM	06/02/2018 4:42 PM	Pending	
CKTestCase_FIXED2	1	06/02/2018 4:47 PM	06/02/2018 4:04 PM	Pending	
+ brainCKQ2_pat1	2	06/02/2018 4:28 PM	06/02/2018 4:19 PM	Completed	
Lung SBRT pt5	1	06/02/2018 4:26 PM	06/02/2018 4:04 PM	Rejected	
CKTestCase_MLC2	1	06/02/2018 4:19 PM	06/02/2018 4:04 PM	Approved	

AUTOMATIC PROCESS

Treatment plans are simply exported from the TPS via DICOM to the SciMoCa dose calculation server. Then SciMoCa starts the Monte Carlo calculation automatically. The patient worklist is automatically updated to keep the user informed about the current QA status of each patient plan.

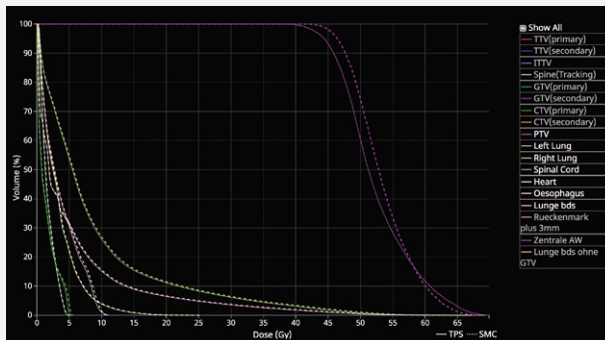
Metric Values	TPS	SMC	% Difference
Oesophagus (Esophagus)			
D40% (< 50.00 Gy)	3.25 Gy	3.26 Gy	-0.31 %
DMean (< 34.00 Gy)	3.22 Gy	3.30 Gy	-2.58 %
Heart			
D33% (< 60.00 Gy)	3.71 Gy	3.81 Gy	-2.69 %
D67% (< 45.00 Gy)	1.33 Gy	1.38 Gy	-3.75 %
D100% (< 40.00 Gy)	0.11 Gy	0.11 Gy	0.00 %
DMean (< 26.00 Gy)	3.26 Gy	3.33 Gy	-2.29 %
Spinal Cord (SpinalCord)			
D0.03cc (< 48.00 Gy)	5.13 Gy	5.46 Gy	-6.44 %
DMax (< 45.00 Gy)	5.25 Gy	5.54 Gy	-5.58 %
Lunge bds (Lungs)			
D30% (< 20.00 Gy)	5.25 Gy	5.37 Gy	-2.29 %
DMean (< 20.00 Gy)	5.73 Gy	5.88 Gy	-2.62 %
PTV (PTV_1)			
D95% (> 95.00 % Rx)	64.10 % Rx	67.06 % Rx	-2.96 %
DMax (< 110.00 % Rx)	100.91 % Rx	98.47 % Rx	2.44 %

Legend: ● Meets Limit ● Below/Exceeds Limit ● Within Limits/Variation Acceptable

AUTOMATIC ANALYSIS

SciMoCa provides automatic evaluation of dose calculation results based on customizable protocols and plan quality measures for both target volumes and OARs.

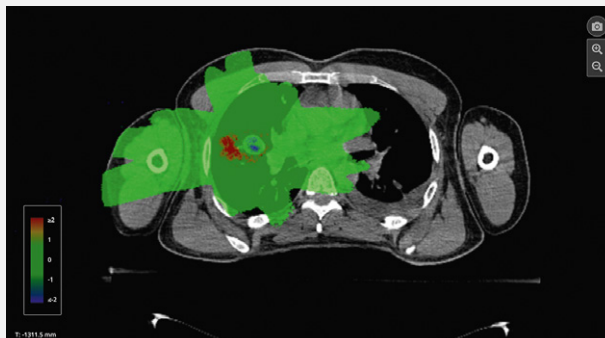
This allows users to evaluate plan quality as well as identify dose discrepancies based on user-defined dose-difference thresholds.



COMPARATIVE DVH

DVHs for the treatment plan as well as the independent SciMoCa dose distribution are compared in the comparative DVH section.

The software allows individual selection of structures for the DVH display, thereby enabling a detailed and focused evaluation of relevant ROIs.



3D ANALYSIS VIA SLICE VIEWER

SciMoCa includes a slice viewer to visualize the TPS dose, SciMoCa-recalculated Monte Carlo dose, and Gamma analysis on individual CT slices. The 3D viewer permits detecting dose discrepancies on the patient anatomy level.

** SciMoCa published results: Gamma 2%/2mm pass > 97%, with deviation SciMoCa vs. Acuros® of mean dose in patients < 1%: Hoffmann et al., Validation of the Acuros® XB dose calculation algorithm versus Monte Carlo for clinical treatment plans. Med Phys. 2018 June 16



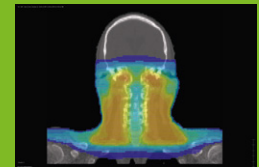
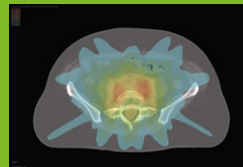
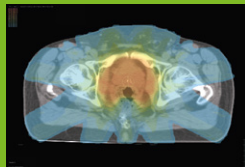
Discover more about SciMoCa:
iba-dosimetry.com

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Monte Carlo Calculation Speed and Accuracy

	prostate, static IMRT [8 beams, 44 segments]	prostate/LN, dMLC [7 beams, 140 control points]	head & neck, VMAT [2 arcs, 293 control points]	
PTV volume	193.3 cc	979.8 cc	834.4 cc	
voxel size	3 mm	3 mm	3 mm	2 mm
calculation time	15.8 sec	55.6 sec	40.9 sec	118.9 sec



Calculation times on dual 8-core Intel Xeon E5-2690 server with hyperthreading [32 logical cores] for dose calculation with final statistical uncertainty of 1%.

SciMoCa Recommended System Requirements [v. 1.0 +]

Minimum recommended specifications:

Recommended specifications:

	Minimum recommended specifications:	Recommended specifications:
CPU	x64-based processors 4C/8T, 1.4GHz or faster	x64-based processors 8C/16T, 1.4GHz or faster
RAM	8GB of RAM	20GB of RAM
Operating System	Windows™ Server 2012 R2 Standard or newer with IIS enabled	
Software	.NET 4.6.2, IIS	
Database	Microsoft SQL Server 2012 Standard or newer	
Monitor	a Medical grade with minimum native display resolution of 1024×768 and 32-bit color	
Language	English [US] or English [UK]	
Free Hard Disk Space	20GB	

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IBA Dosimetry

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