NA-MIC
National Alliance for Medical Image Computing
http://www.na-mic.org

Qualitative and quantitative comparison of two RT dose distributions

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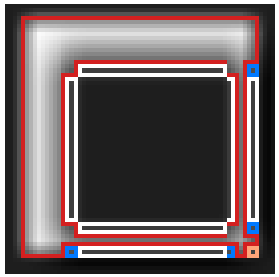
NA-MIC Tutorial Contest: Summer 2012

Learning Objective

THIS TUTORIAL DEMONSTRATES HOW TO COMPARE TWO DOSE DISTRIBUTIONS

Qualitatively

by analyzing isodose distributions



Quantitatively

by direct voxel-by-voxel comparison

using acceptance criteria for:

-- dose difference

-- distance-to-agreement

Pre-requisite

This tutorial assumes that you have already completed

Data Loading and 3D Visualization
by Sonia Pujol

http://www.slicer.org/slicerWiki/index.php/Documentation/4.1/Training

Material

This tutorial requires the installation of the Slicer4.1release and the tutorial dataset. They are available at the following locations:

Slicer download page

http://download.slicer.org

Tutorial dataset: **dose_comparison_data.zip**
http://forge.abcd.harvard.edu/gf/project/plastimatch/frs

Platforms

This tutorial is designed for...

10.7.4

Overview

1. Downloading the Plastimatch 3D Slicer Extension
2. Loading and visualizing sample dose volumes
3. Performing direct voxel-by-voxel dose comparison
4. Running isodose calculation and visualization
5. Performing dose difference and distance-to-agreement acceptance criteria (γ-analysis)

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Downloading the Plastimatch Extension

The Plastimatch Extension is downloadable using
Slicer's integrated Extension Manager
(in the near future)

http://www.plastimatch.org/3d_slicer_integration.html

The Plastimatch Extension can also be compiled manually
(right now)

http://www.plastimatch.org/getting_started.html

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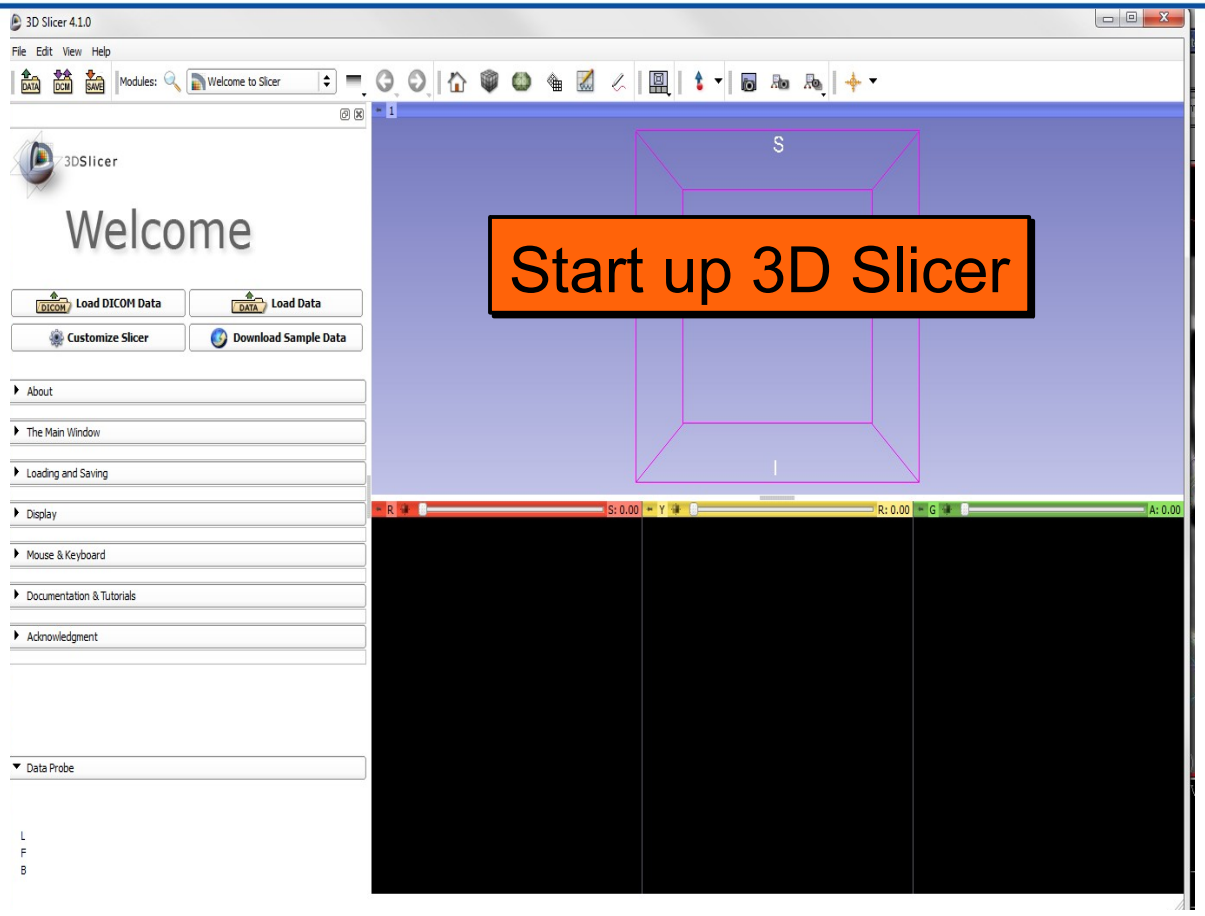
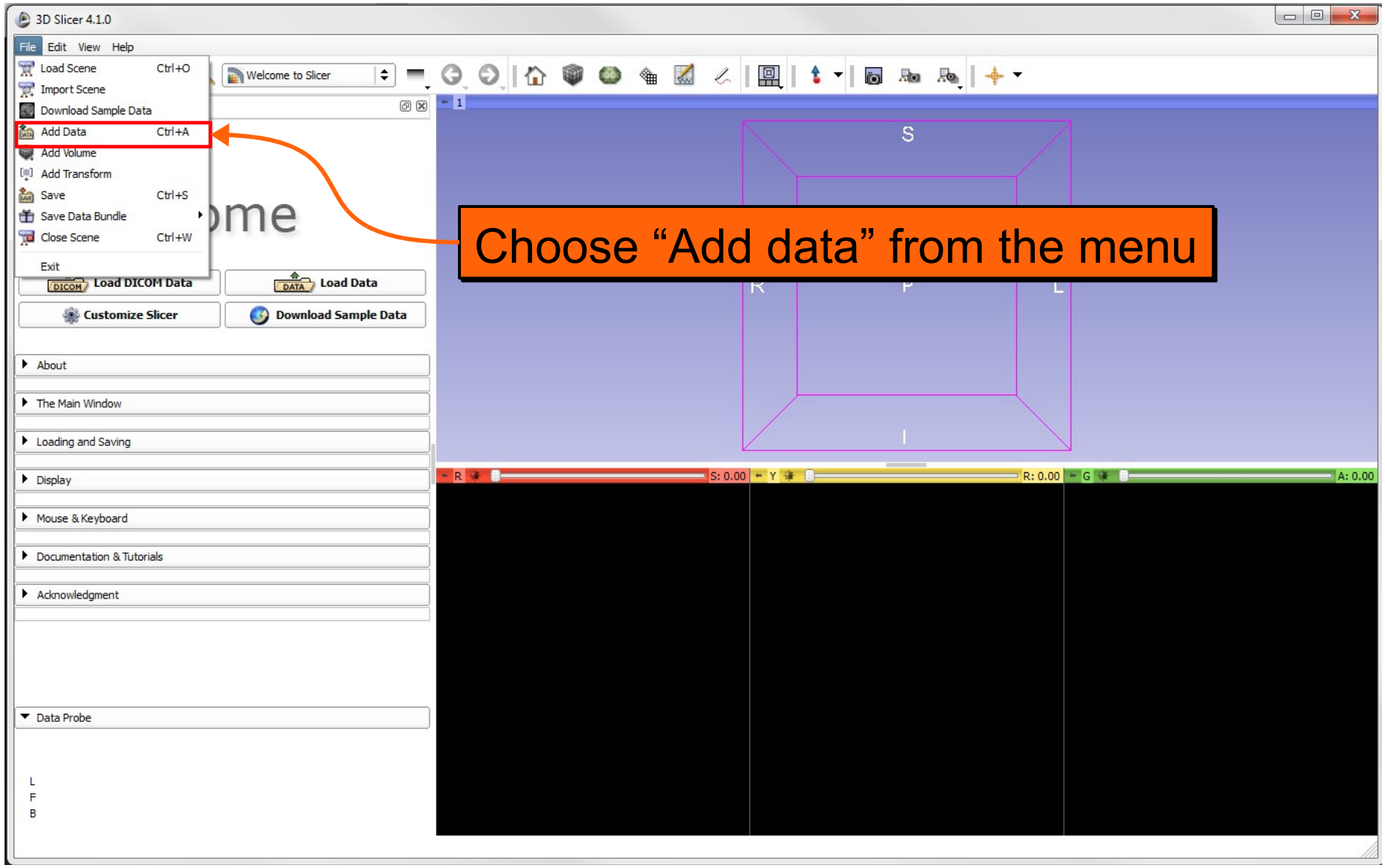
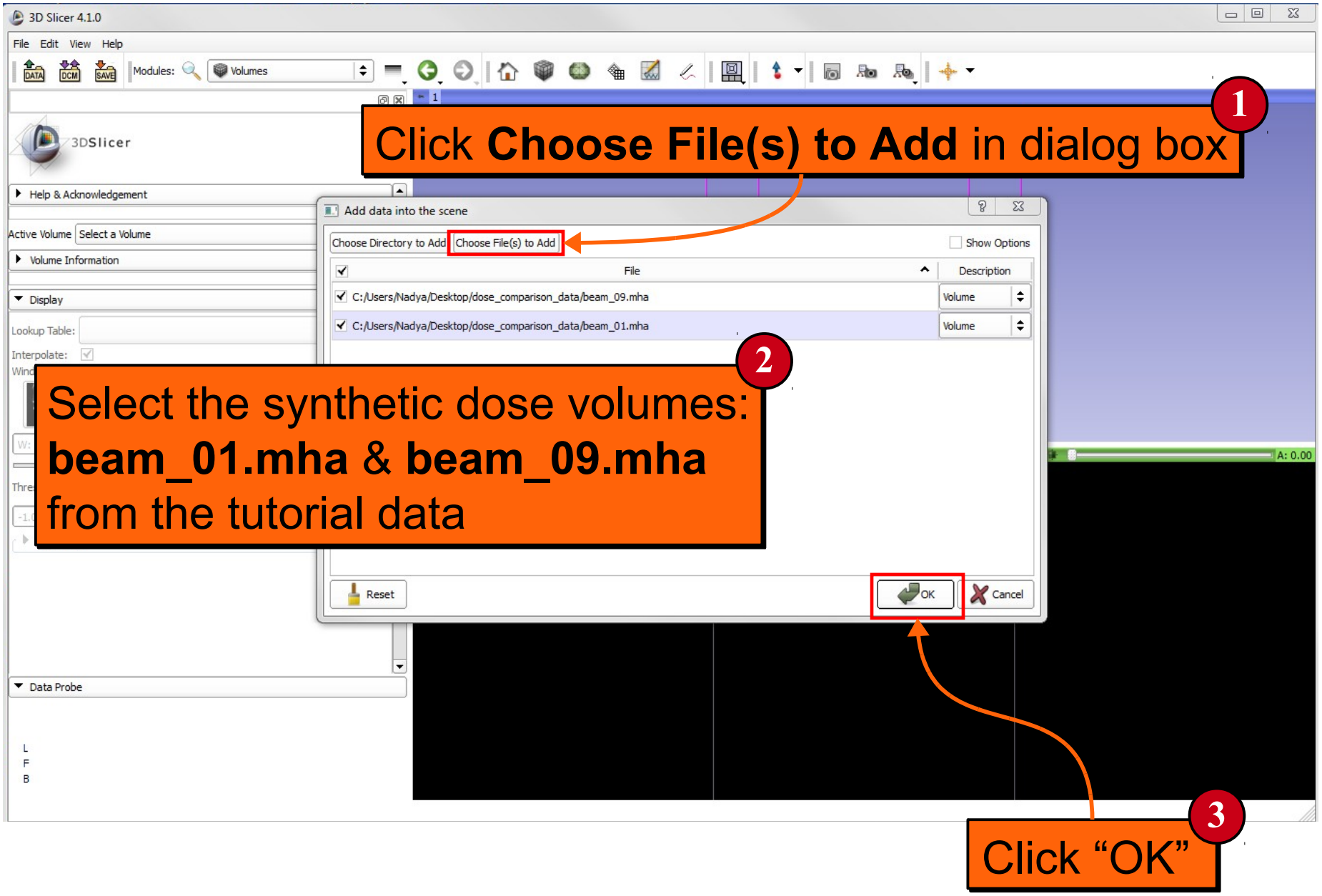
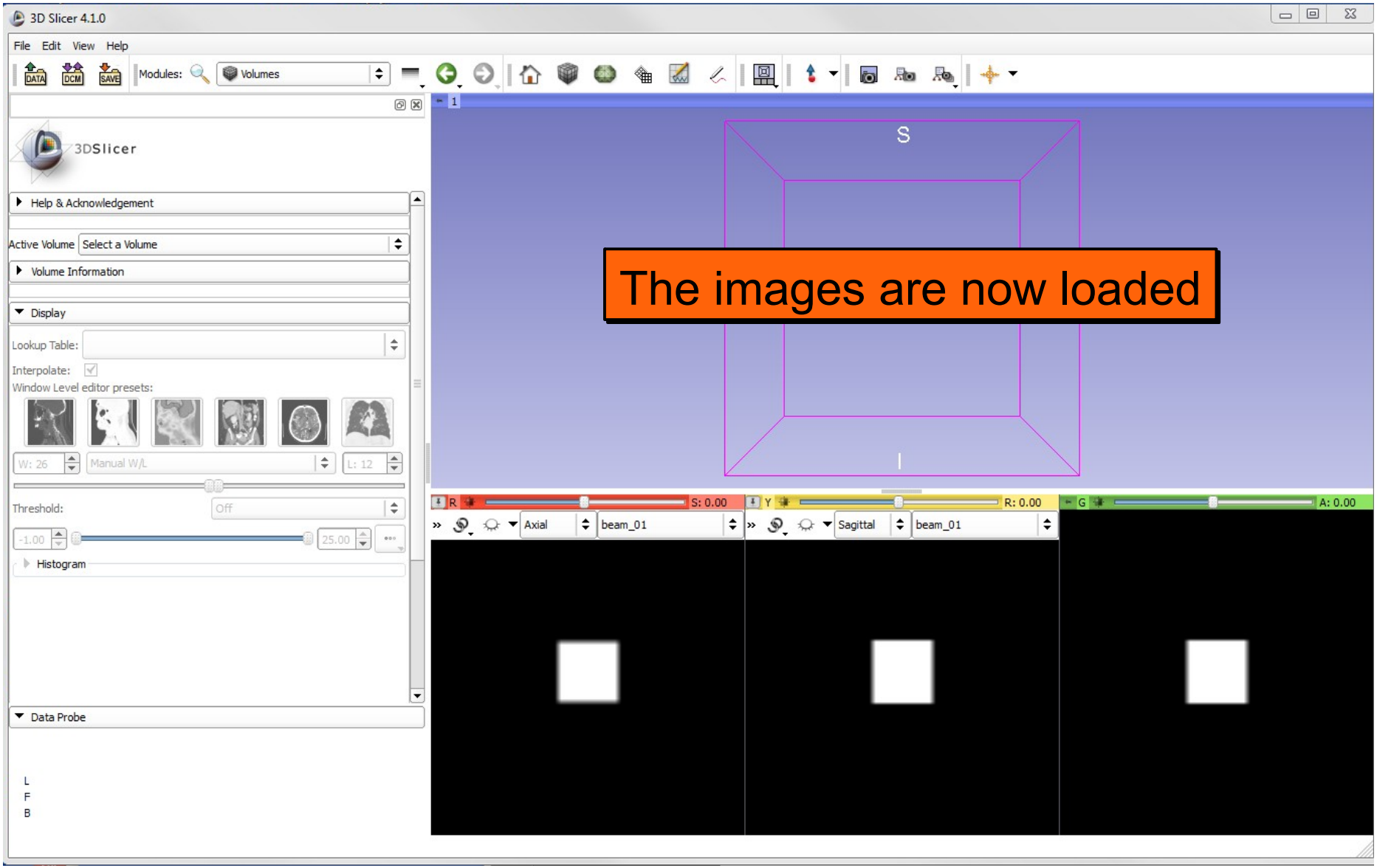
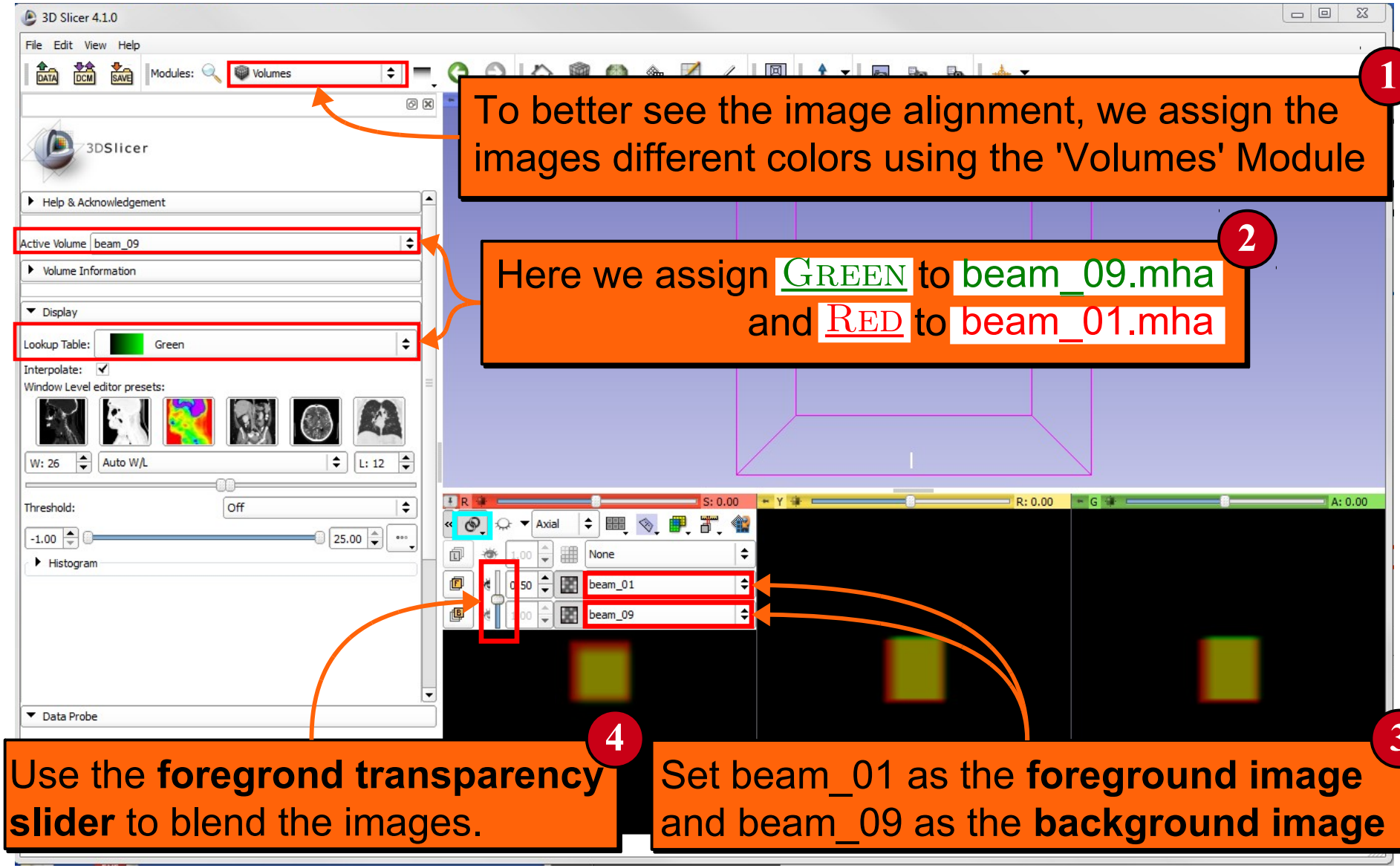
Loading and visualizing the sample data



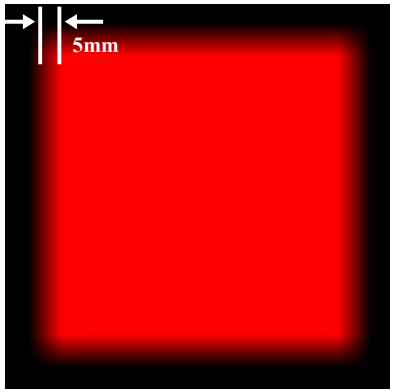




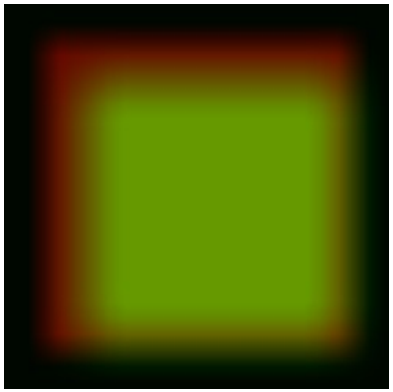




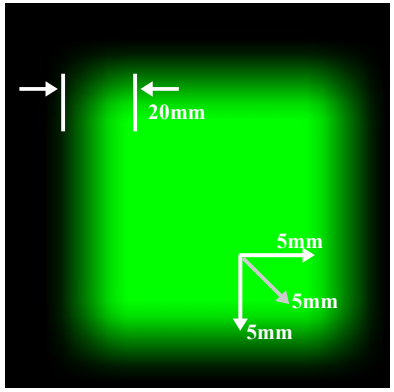
Synthetic dose distributions



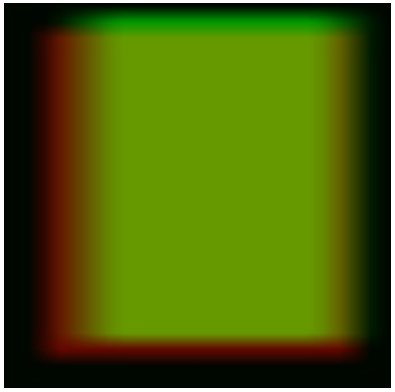
dose_01.mha
- axial view
- 5mm penumbra



superimposition
- axial view



dose_09.mha
- axial view
- 20mm penumbra
- 5mm shift along each axis



superimposition
- coronal view

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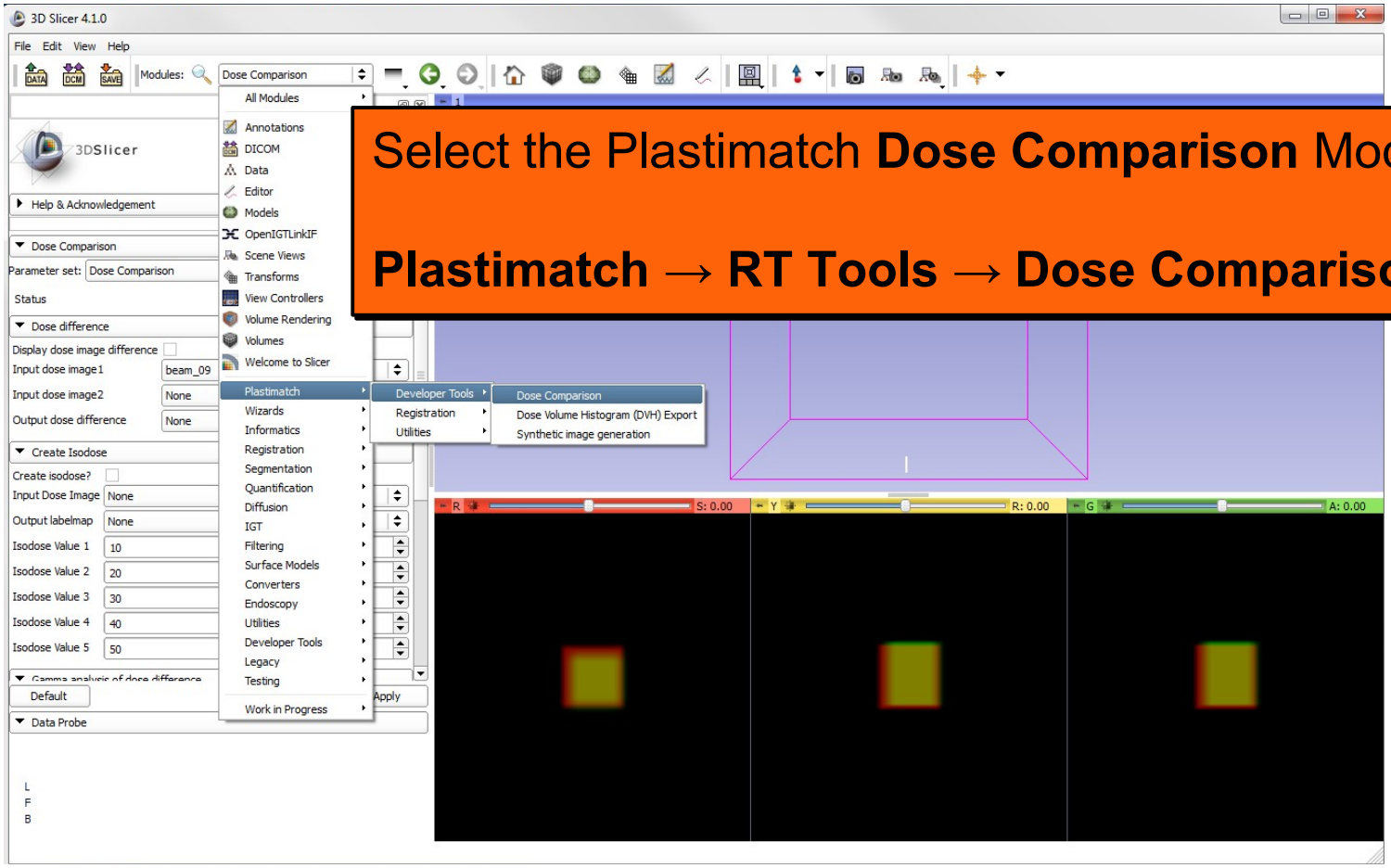
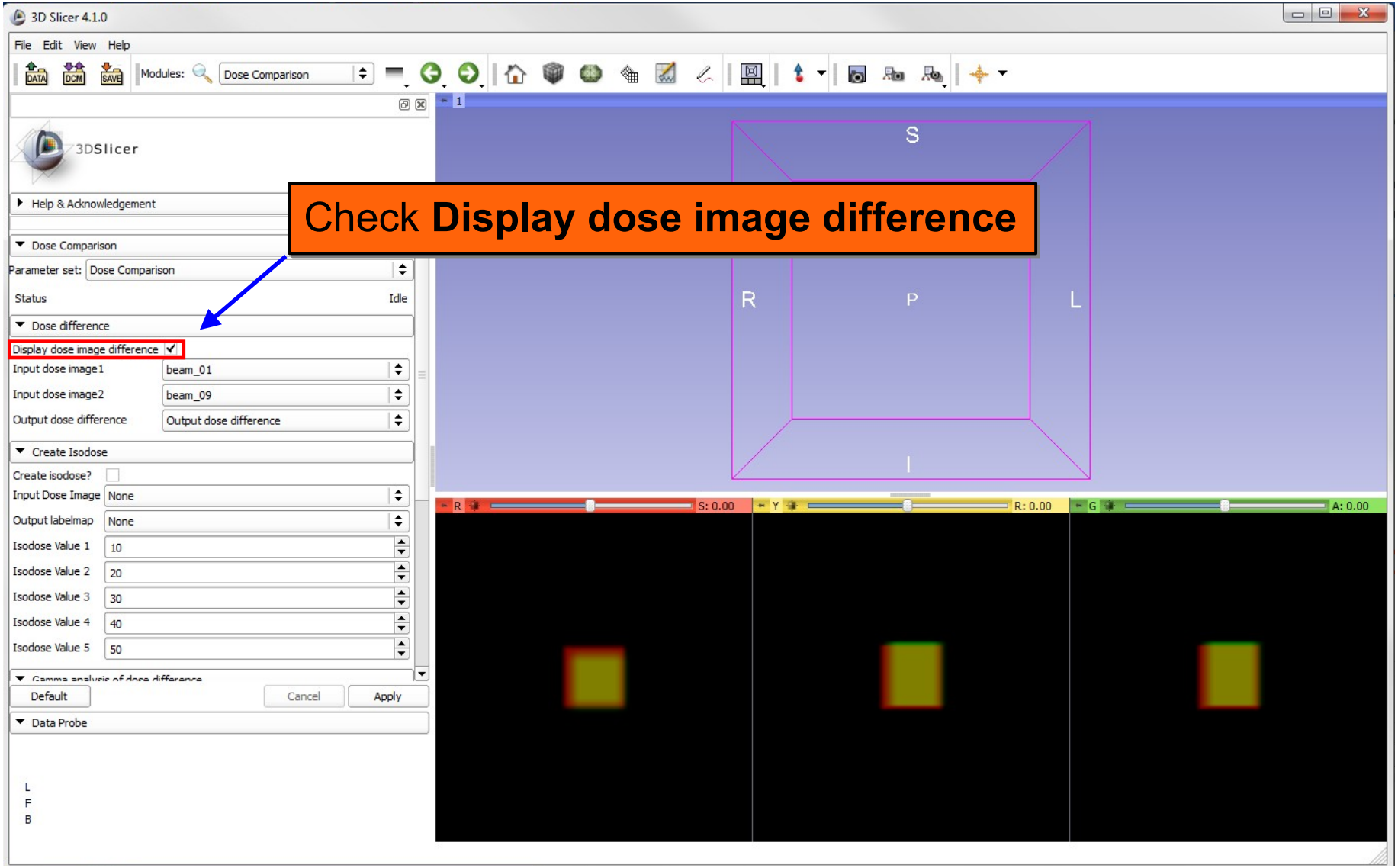
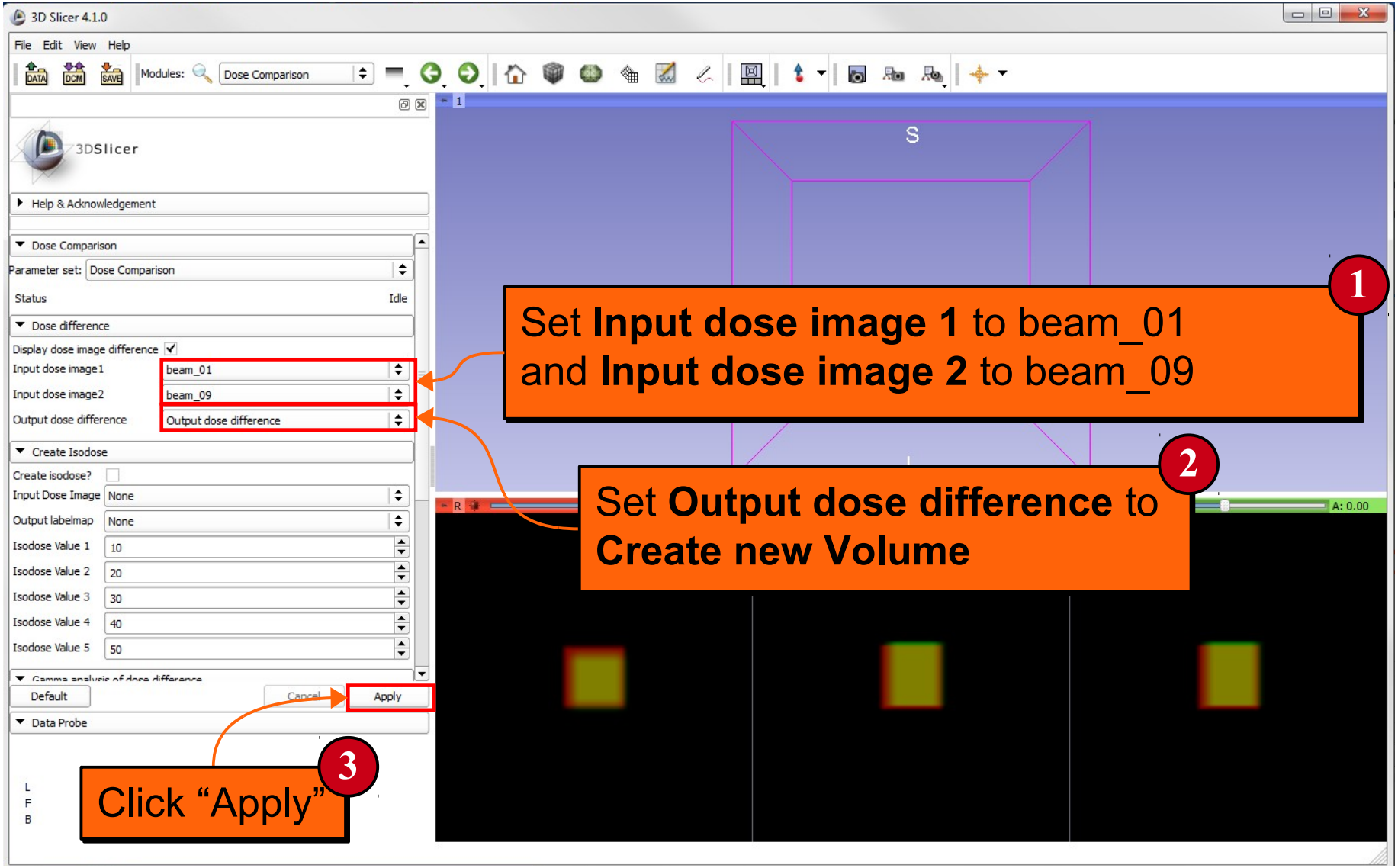
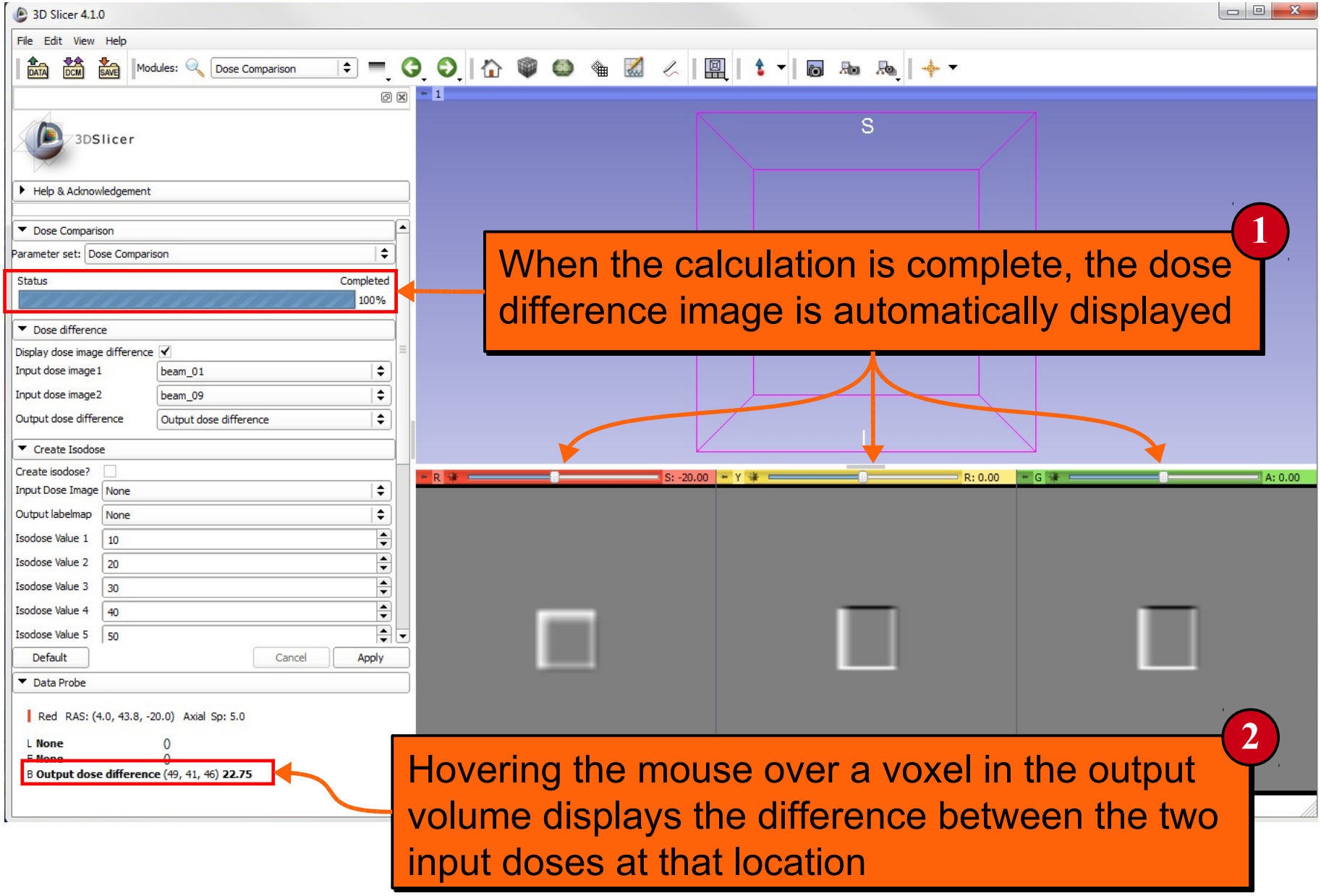
Running direct voxel-by-voxel dose comparison









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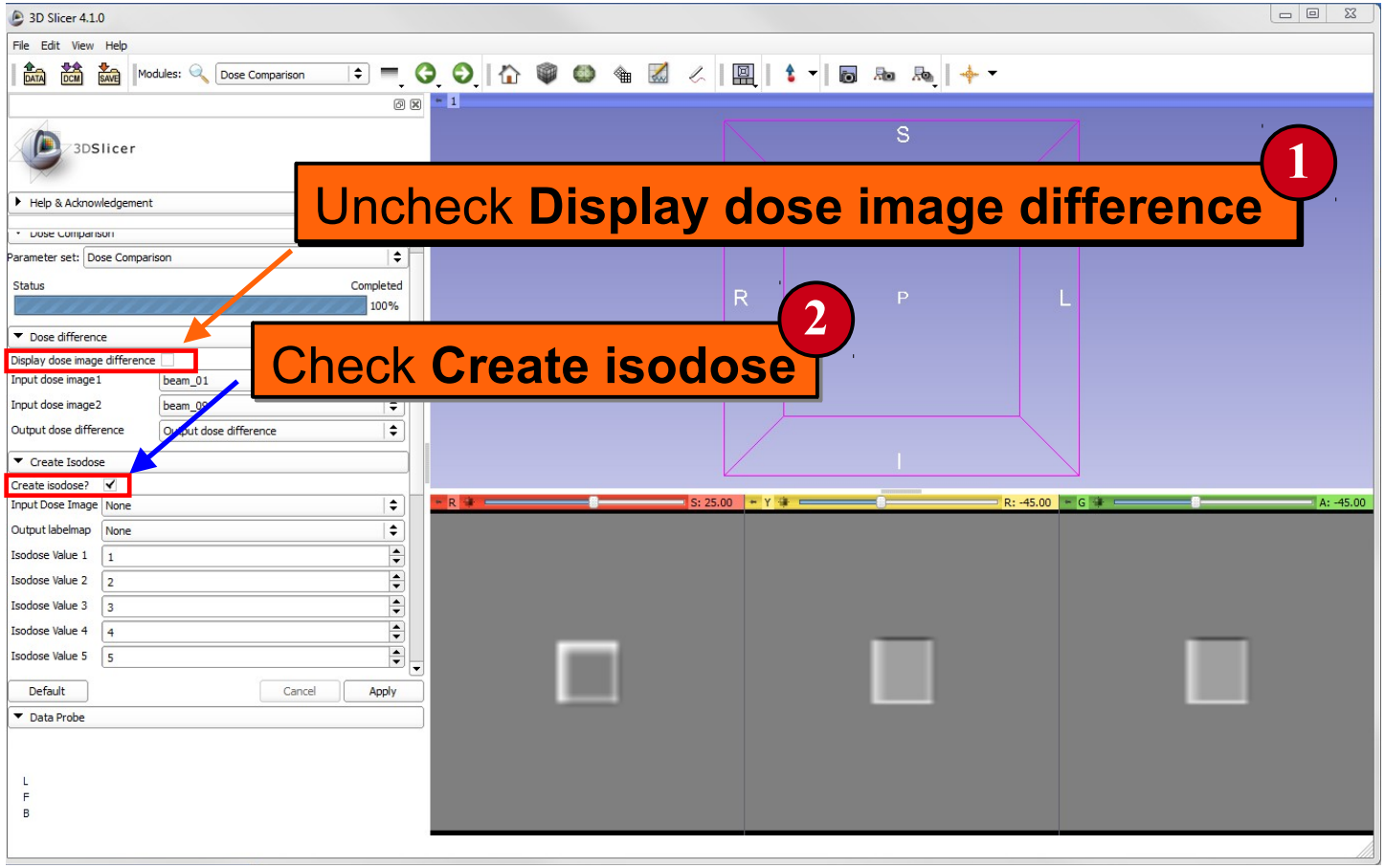
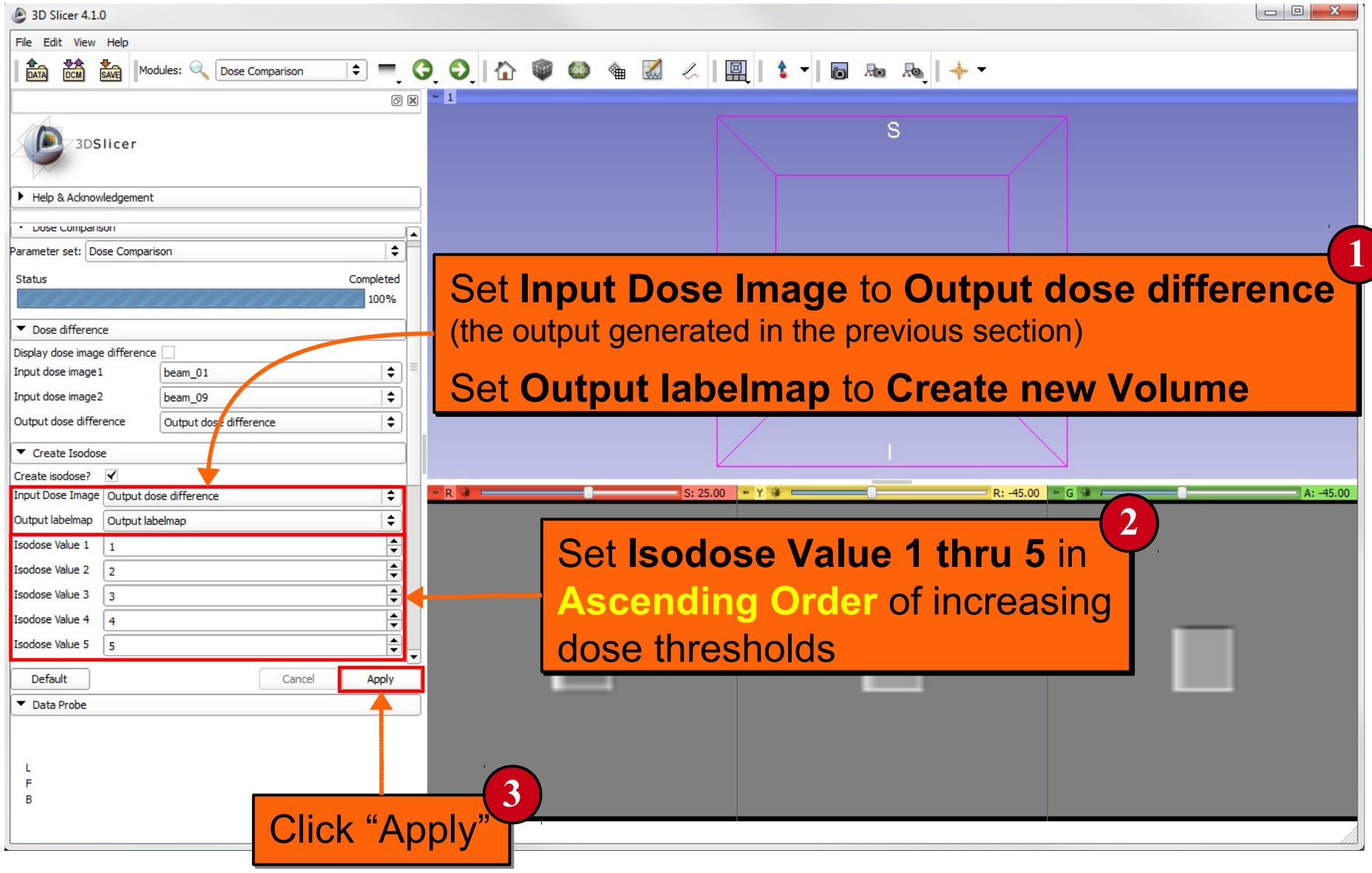
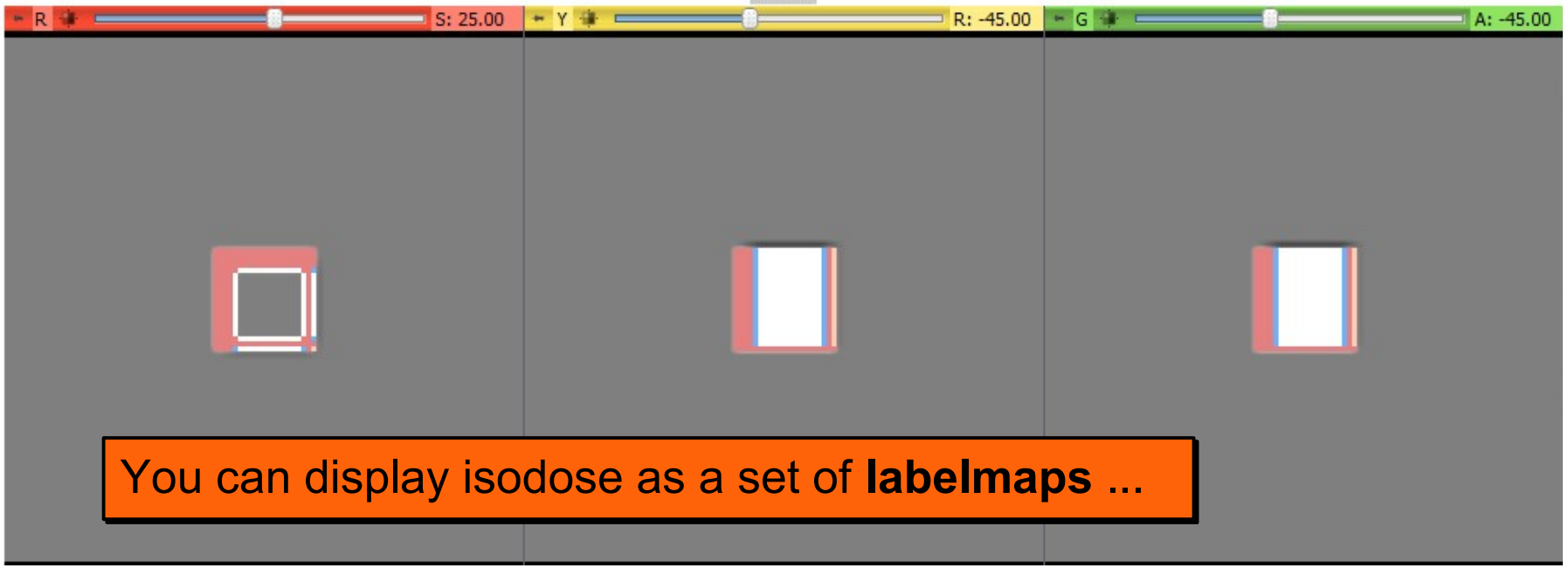
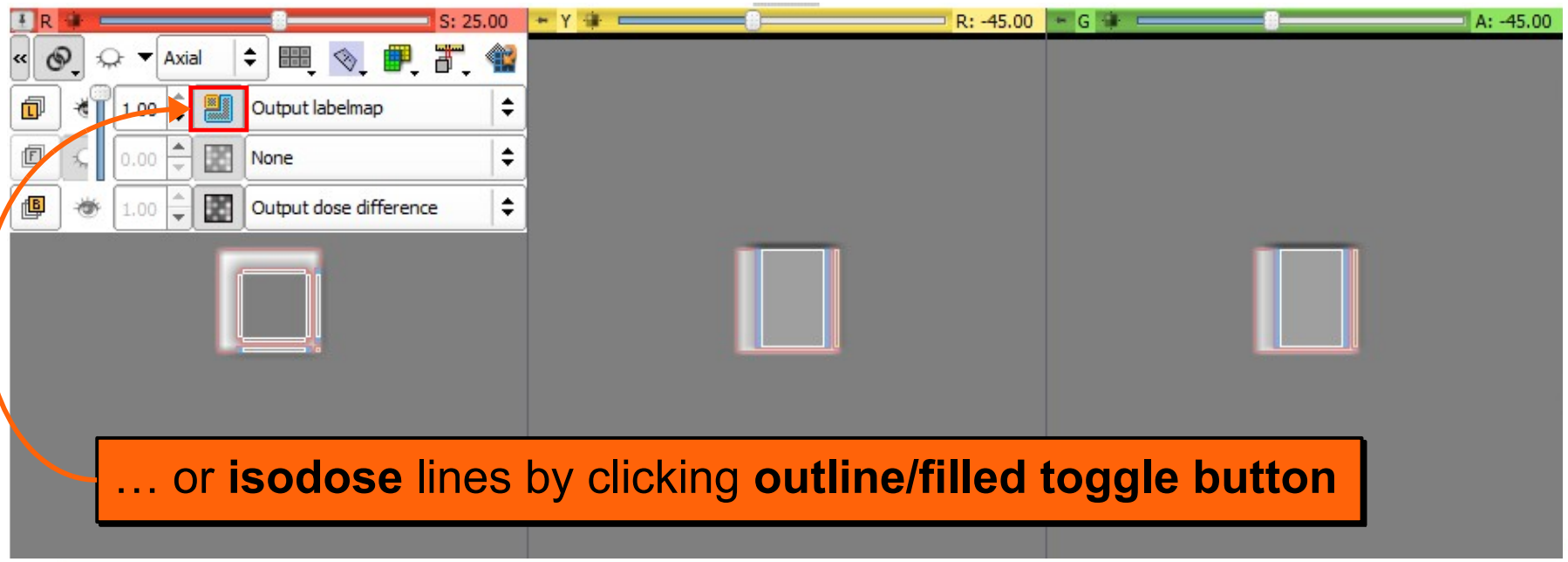
Running isodose calculation and visualization









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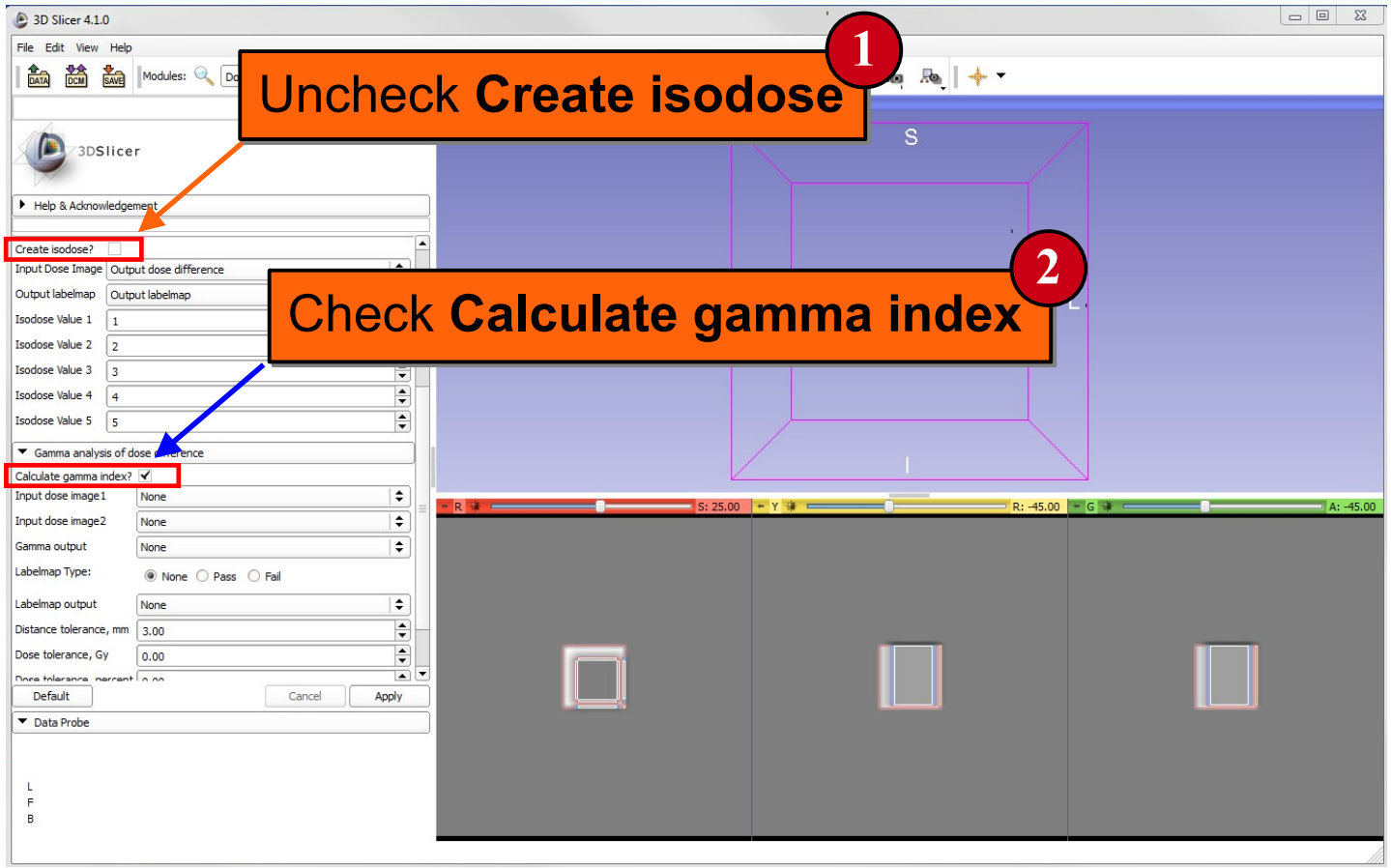
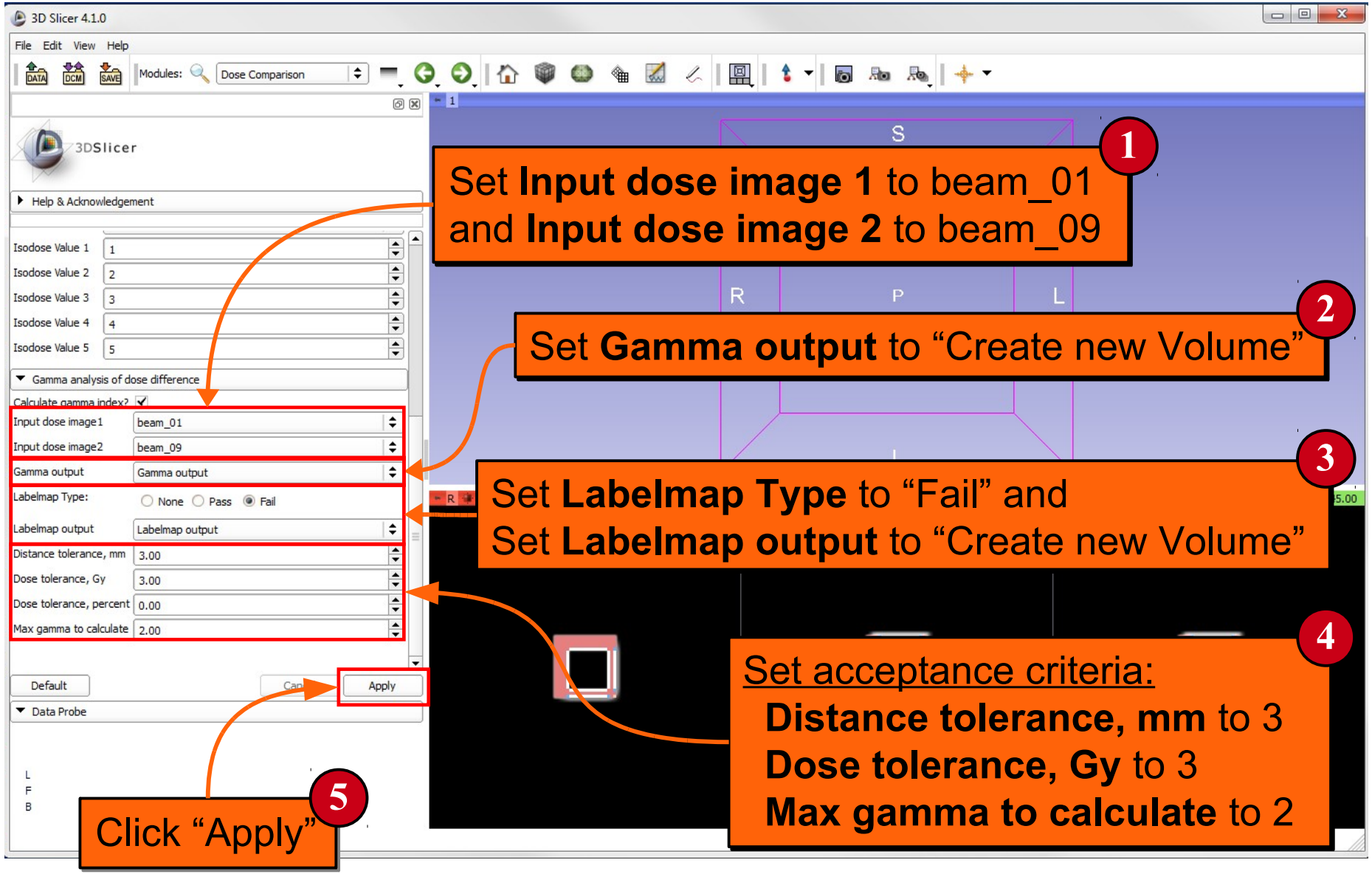
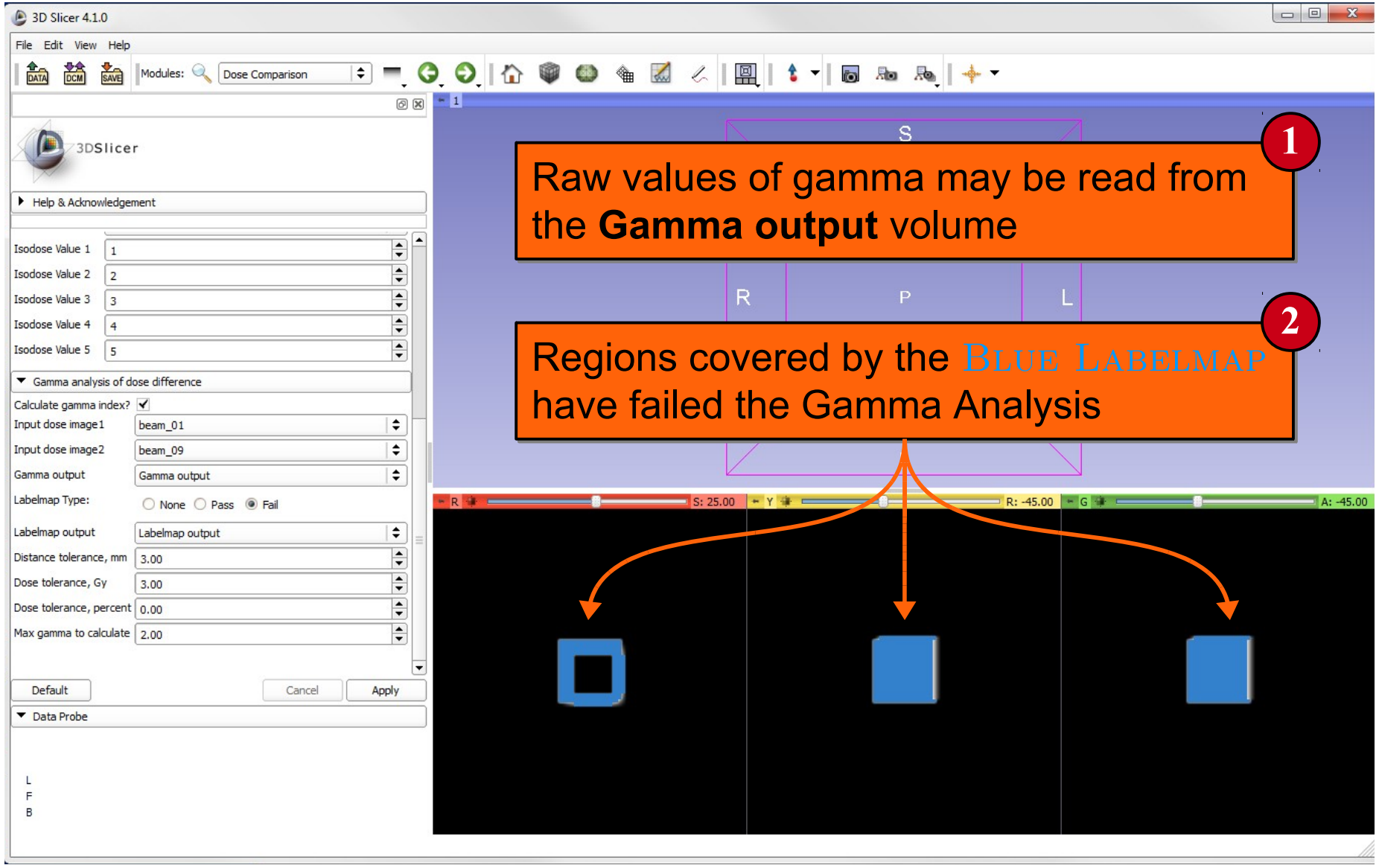
Dose difference and distance-to agreement acceptance criteria







Conclusion

We have demonstrated how to use the Plastimatch Dose Comparison 3D Slicer Extension to perform various methods of dose comparison including: direct dose comparison, isodose visualization, and γ-analysis

THANK YOU!

Acknowledgments

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