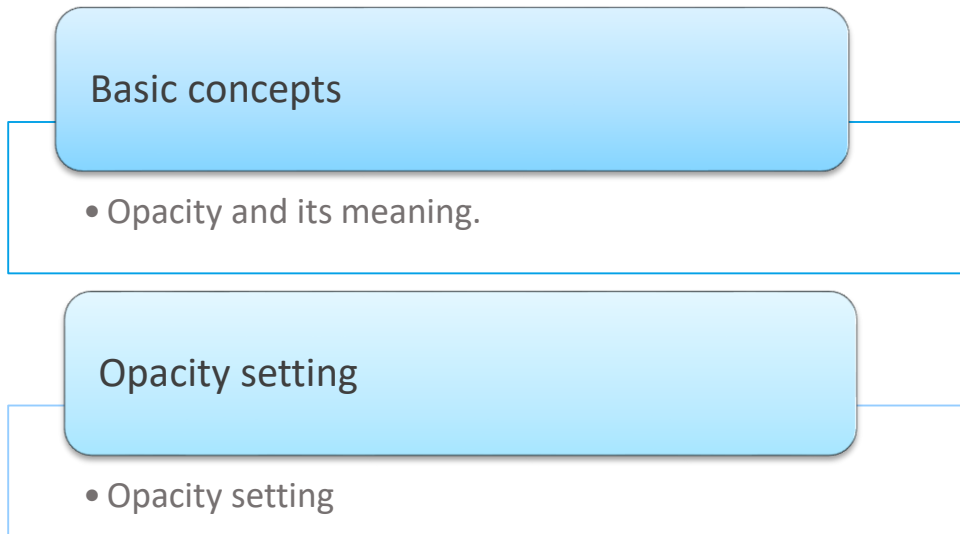# Application Note #5

How to :
«Set Opacity in 3D rendering»

The application-note purpose is to guide the user in performing a optimal opacity setting accordingly to the selected rendering modality

Application Flowchart

Basic concepts

- Opacity and its meaning.

Opacity setting

- Opacity setting

Index

1. Basic concepts

1.1 Making more or less transparent the biological structures, digitally acquired in their complex world, allow us to see through the objects in the foreground. The contribution of the voxels in front of you, referred to your point of view (camera view), is reduced comparing to their real intensity value. The intensity reduction is obtained by editing their opacity coefficient accordingly to our visualization needs. This operation is defined as the single voxels intensity values mapping vs the opacity coefficient.

However, this allows only a limited selection of the structures in the dataset, like specific structures or anatomical regions, since no spatial or specific information is considered. Since the structures do not just differ by intensity values, opacity is typically not suited for the selection or identification of objects in a dataset but only to improve its visibility.

1. Basic concepts (continue)

1.2 The *Opacity* gradient curve is set graphically.

The intensity range is located on the abscissa axis while the Opacity percentage is represented on the ordinate axis
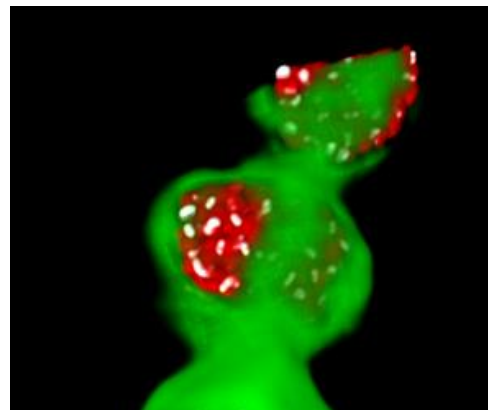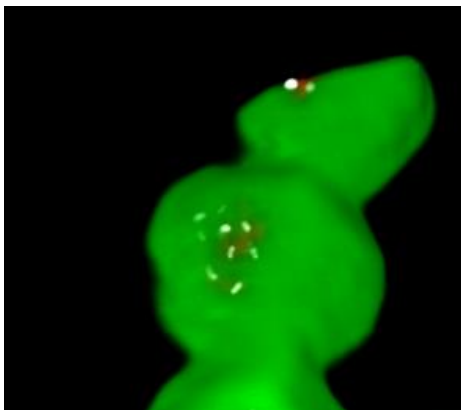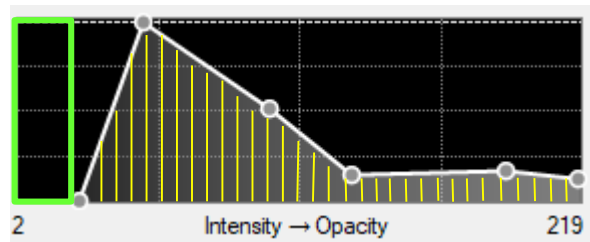

All the voxels having an intensity value located inside the curve, give their contribute proportionally to the Opacity percentage set. The rest of the voxels, located outside the curve, are not visualized.

Hidden   displayed

Here below 2 examples of different levels of opacity on the green channel. High opacity level on the left, low opacity level on the right
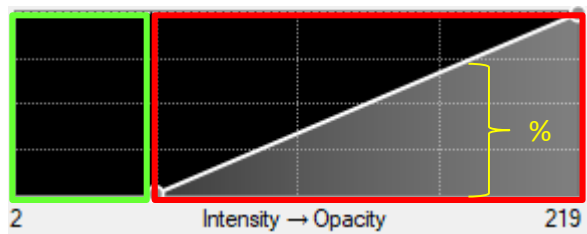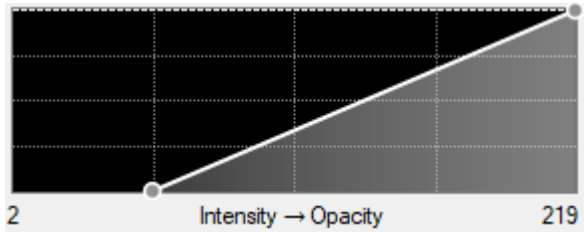
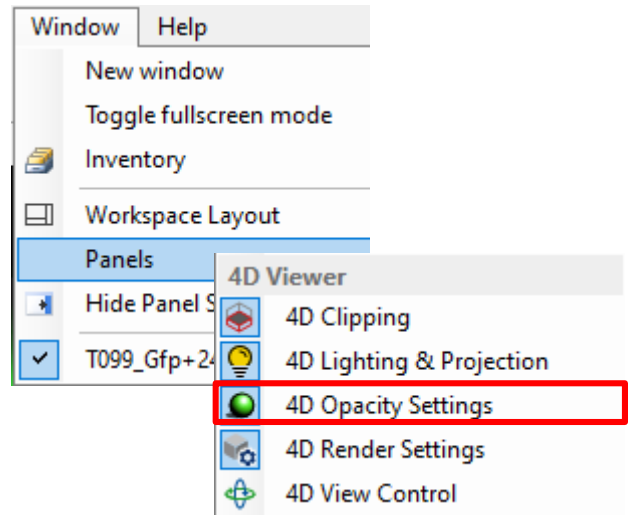# 2. Opacity setting

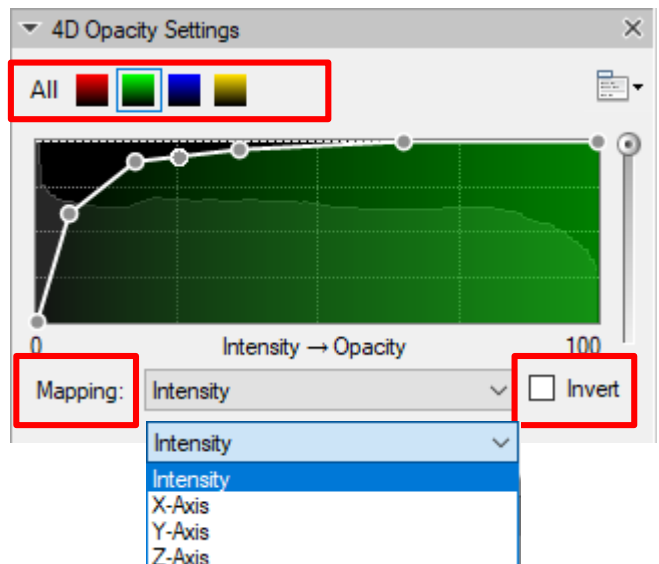**2.1** Open the 4D Opacity Setting panel (Window -> Panel menu).

The channel selector is located on left top corner of the panel.

The *Opacity curve* graph is displayed in the central' panel area.

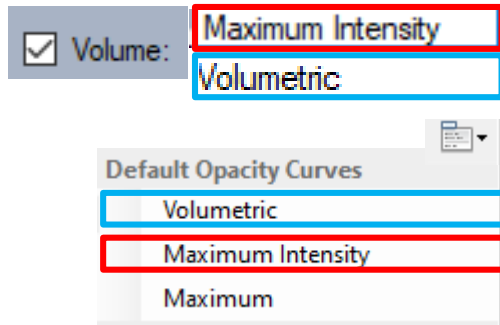The *Mapping* option allows to map the opacity vs the active channel intensity (default).

The *mapping* can be inverted using the *Invert* checkbox

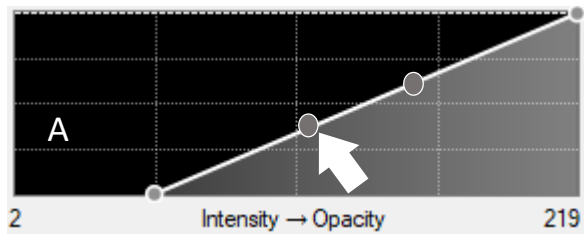As alternative, the opacity can be mapped vs the distance from the origin of one of the axes (x, y or z).
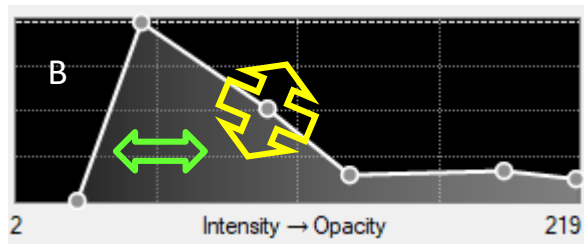
2. Opacity setting (contiune)

2.2 Set the default *Opacity* curve accordingly to the active rendering mode.
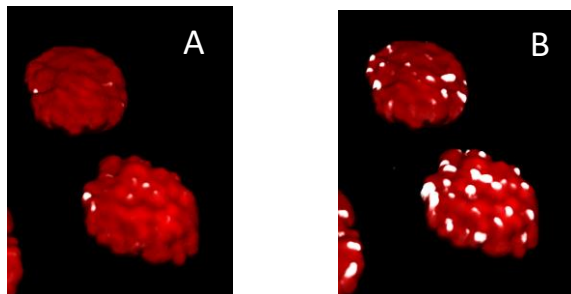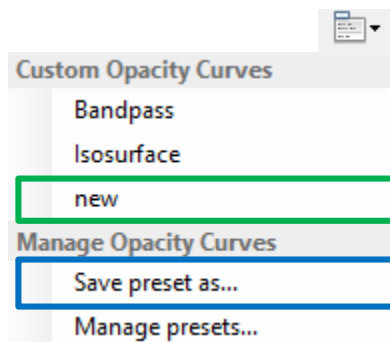
2.3 Change the *Opacity* curve shape acting on it. A new points can be added mouse left clicking on the line

Drag the points to change the curve shape.
Move the curve left or right to position it on the dynamic range.

2.4 Save the *Opacity* curve as a preset (optional). The new preset will be shown in the pop up menu under the "***Manage Opacity Curves***" section.

Contact the arivis application support to receive additional technical details about the topic described in the application note, or how to adapt the application workflow to your requirements.

"The quantitative analysis of the images represents the art of transforming a visual sensation into its schematic and discrete form allowing its univocal description, classification and mathematical and logical interpretation of its spatial and temporal components"

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