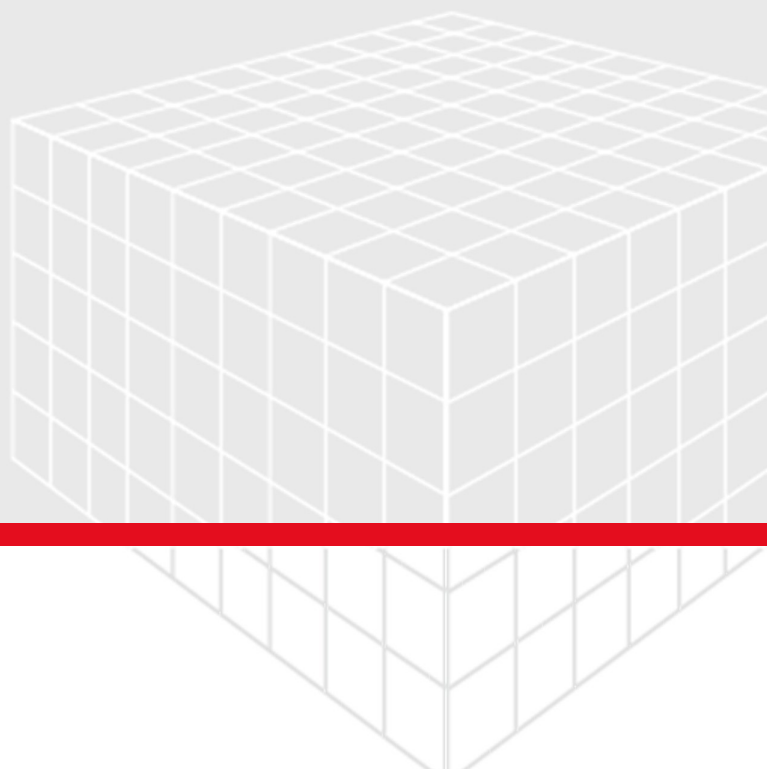


Create Videos

User Guide

GEODICT Release 2026

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GEODICT

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Create Videos

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1 Create Videos

Videos are an excellent medium to visualize time-dependent processes, 3D scans and structure models from all sides. Moreover, scrolling through the slices in 2D in a video is a great possibility to visualize a complete structure in detail.

GeoDict provides many visualization options, offering great animations for videos from all kinds of GeoDict results.

The **Create Video** dialog offers a variety of presets that are either ready-to-use with one click or can be tailored to your needs by defining own presets and combining the animations fitting best to your results.

Different video formats and quality options are available to save movies with the perfect settings for individual purposes.

Learn how to create videos in GeoDict

- [Create Video Dialog](#)  ⁴
Animate your GeoDict results using presets and add your own presets.
- [Video Editor](#)  ²³
Create your own custom animations using all possible visualization settings in GeoDict.
- [Results](#)  ⁴⁴
View your animation results.



Join the conversation

Visit the Community on [GeoDict Forum](#) to be inspired and get answers to top questions.

Find illustrative application examples on the [website](#).

Our tutorials and seminar videos give you a first hands-on experience. They are collected in the [Learning Center](#).

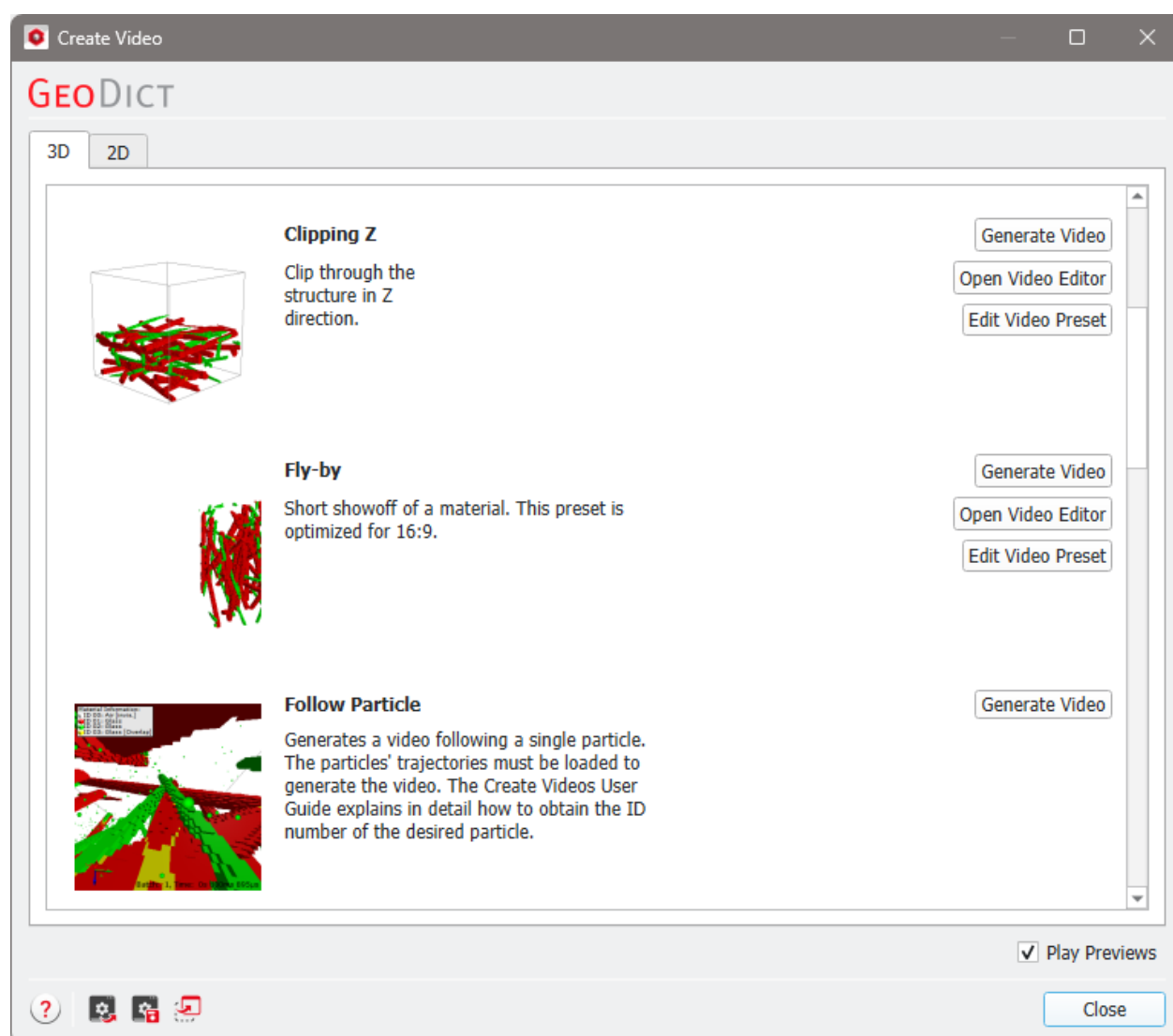
Send your [Support Request](#) to our technical Support.

1.1 Create Video Dialog

The video dialog gives access to several preset animations and creating your own animations.

If a structure or a volume field is loaded in the Visualization area of the GeoDict GUI, the **Create Video** dialog opens after selecting **File** → **Save Video as...** from the menu bar or by clicking the icon  in the GeoDict toolbar.

In the **Create Video** dialog, the options are organized into the **3D** and **2D** tabs. The **Create Video** dialog opens automatically to the **2D** tab or the **3D** tab depending on the current view (2D or 3D) in the Visualization area. That is, the **3D** tab is active if a structure is visualized in 3D while opening the **Create Video** dialog. When switching to the **2D** tab, the visualization of the structure changes to 2D view automatically in the GeoDict GUI.

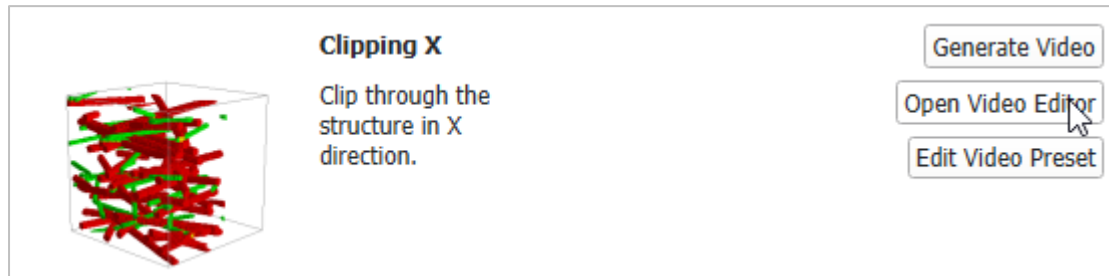


✓ Use Presets

For 3D and 2D visualization, the **Create Video** dialog contains a selection of several [preset animations](#) ¹⁰ that are used to create a video immediately after clicking the

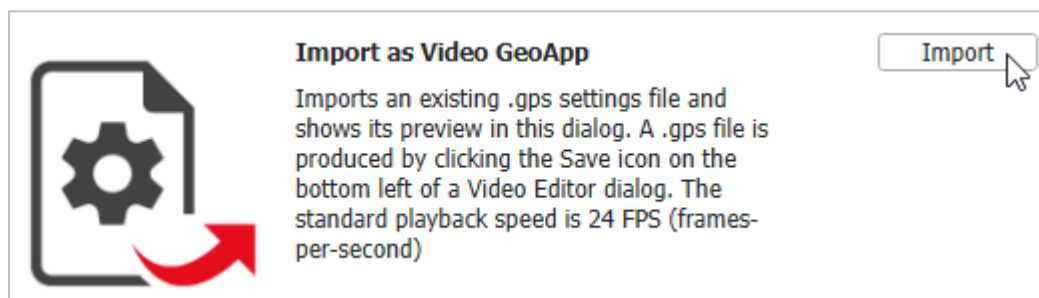
corresponding [Generate Video](#)⁷ button.

The preset file for each animation may be opened and edited in the [Video Editor](#)²³ dialog by clicking the **Open Video Editor** button. The preview on the left shows (approximately) how the finished video will look like.



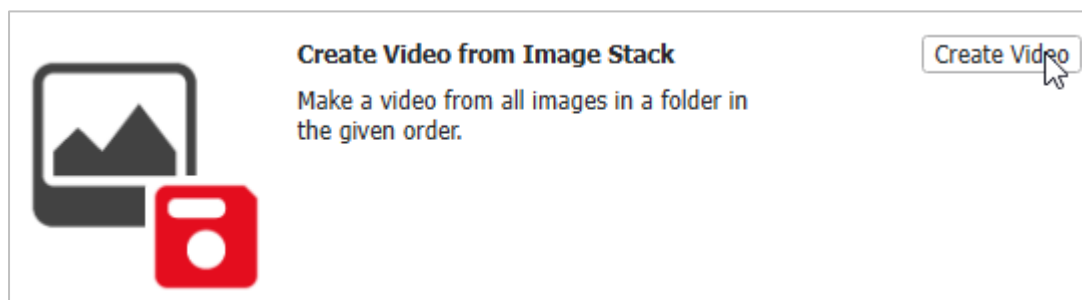
✓ Import as Video GeoApp

Via the [Import as Video GeoApp](#)¹⁹, your own video presets are added to the **Create Video** dialog and are displayed with their own preview.



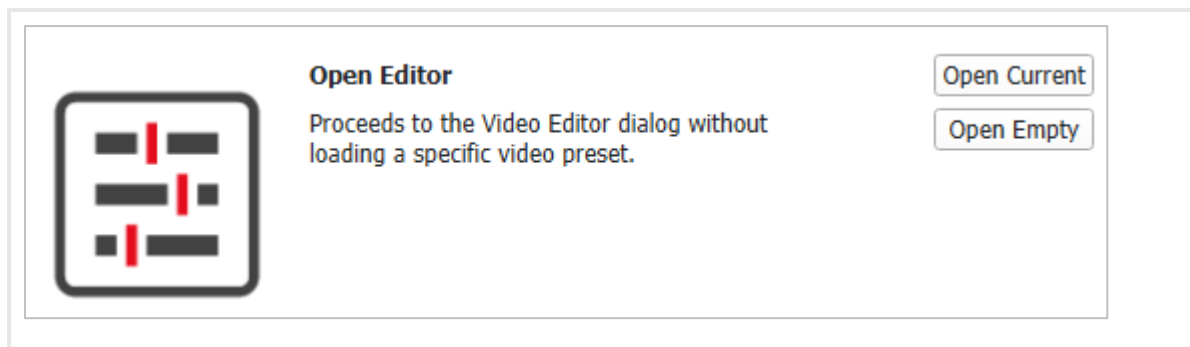
✓ Create Video from Image Stack

[Create Video from Image Stack](#)²⁰ converts a stack of single frames into a video.



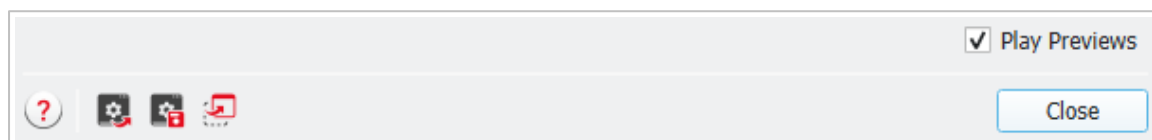
✓ Open Editor

Finally, the [Video Editor](#)²³ dialog can be opened containing the last edited animation by clicking **Open Current** or as a fresh, empty dialog by clicking **Open Empty**.

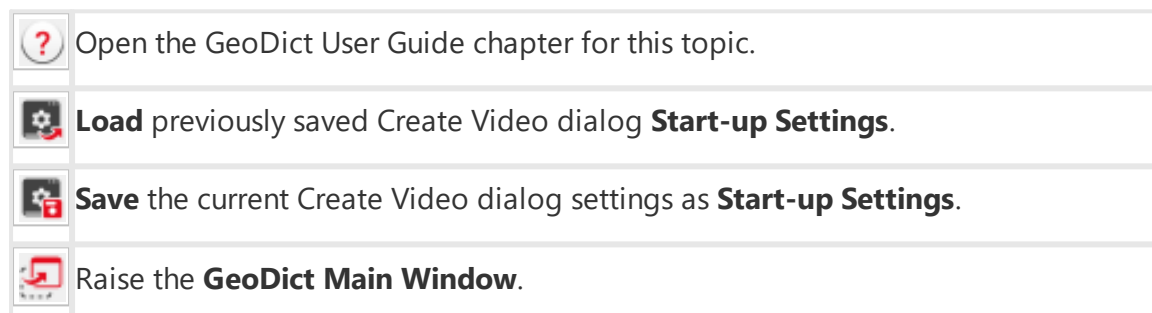


✓ General Options

Uncheck **Play Previews** on the bottom right of the **Create Video** dialog to stop the animation of the previews that display the Video Presets.



Resting the mouse pointer over an icon prompts a tooltip showing the icon's function to appear.



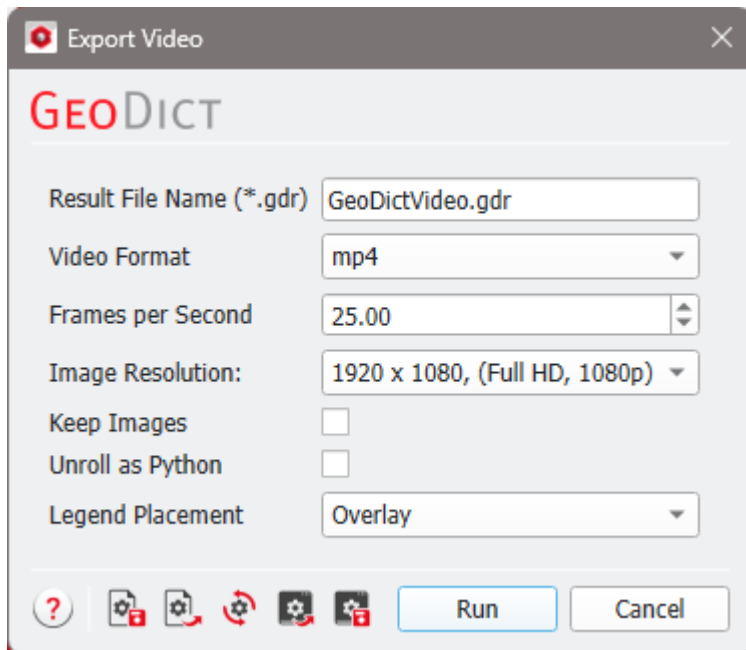
Clicking **Close** closes the **Create Video** dialog.

Topics of this section

- [Generate Video](#)⁷
Open the Export Video dialog giving access to export settings as name, format, FPS, and more.
- [Video Presets](#)¹⁰
Several video presets are provided that let you generate great videos from the loaded microstructure by simply clicking Generate Video.
- [Import as Video GeoApp](#)¹⁹
Add your own video presets to the Create Video dialog where they are displayed with their own preview.
- [Create Video from Image Stack](#)²⁰
An existing stack of single frames is converted into a video.

1.1.1 Generate Video

Clicking **Generate Video** for any of the presets or in the **Video Editor** opens the **Export Video** dialog.

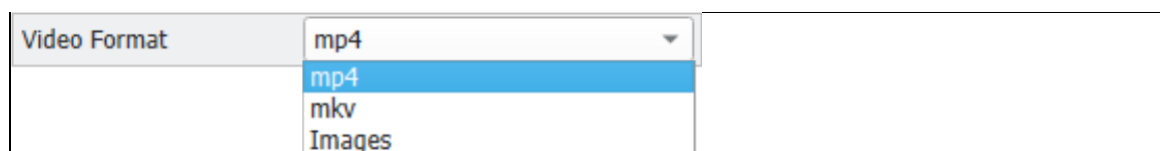


✓ Result File Name (*.gdr)

Enter a customized **Result File Name (*.gdr)** to differentiate the generated videos. The resulting GDR file will be placed inside the project folder next to the generated video with the same name. Additionally, a result folder also with the same name is generated, containing the structure file (*.gdt) and the saved images if [Keep Images](#) was activated.

✓ Video Format

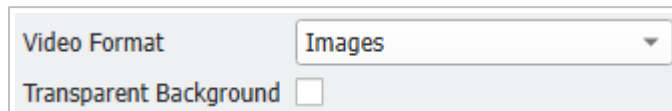
For **Video Format**, choose between three different video formats:



- **MP4**: Best format for any application, with the resulting video being of good image quality at a reasonable size.
- **MKV**: MKV files are multimedia container formats, which can include different and mixed audio and video formats. Since this is not an industry standard not all media players support it.
- **Images**: If this format is checked, no video is generated. Instead, only the images are created and stored in the result folder.

✓ Transparent Background

If **Images** in 3D view are generated, the option **Transparent Background** allows to save the images with transparent background if selected.



The screenshot shows a user interface for video settings. On the left, the text 'Video Format' is displayed. To its right is a dropdown menu currently showing 'Images'. Below this, the text 'Transparent Background' is followed by an unchecked checkbox.

✓ Frames Per Second

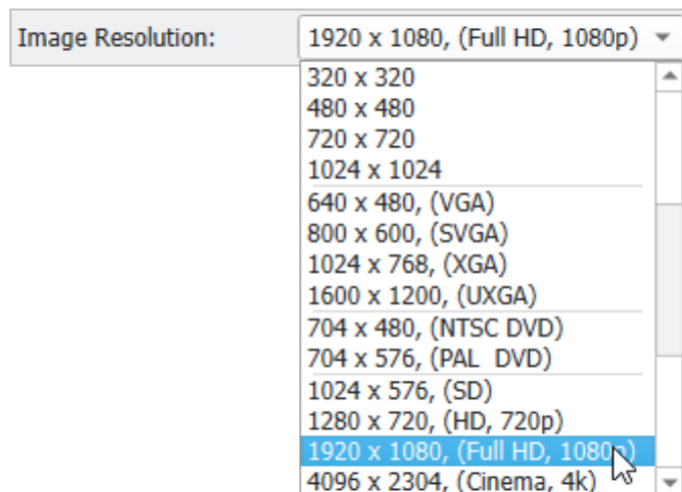
The option **Frames Per Second** is available for the MP4 and MKV video formats. Increasing the number of frames per second increases the number of images shown within a second of the video and the video appears smoother.

If the number of frames per second is increased from 25 to 50, the video plays twice as fast. To counteract this and maintain the same duration of the video, the total number of frames must be doubled in the [Video Editor](#)³¹.

✓ Image Resolution

The **Export Video** dialog comes with a great variety of choices for formats and sizes for **Image Resolution**.

Choose the one that best fits your application area. In most cases, the **Full HD** preset works perfectly.



The screenshot shows a dropdown menu for 'Image Resolution:'. The menu is open, displaying a list of resolution options. The currently selected option is '1920 x 1080, (Full HD, 1080p)'. Other visible options include '320 x 320', '480 x 480', '720 x 720', '1024 x 1024', '640 x 480, (VGA)', '800 x 600, (SVGA)', '1024 x 768, (XGA)', '1600 x 1200, (UXGA)', '704 x 480, (NTSC DVD)', '704 x 576, (PAL DVD)', '1024 x 576, (SD)', '1280 x 720, (HD, 720p)', and '4096 x 2304, (Cinema, 4k)'. A mouse cursor is pointing at the '1920 x 1080, (Full HD, 1080p)' option.

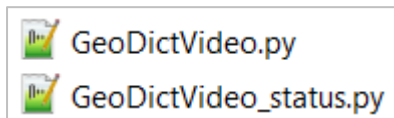
✓ Keep Images

By default, the single images temporarily rendered to create the video are deleted to save disc space after the video generation has finished. For further video editing and to use them instead of the compressed video, the images may be kept by checking **Keep**

Images. For the **Images** video format, the checkbox is grayed out and checked automatically.

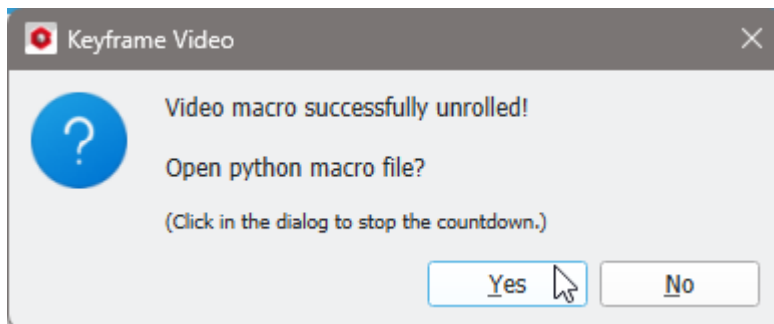
✓ Unroll as Python

Selecting **Unroll as Python** changes the button **Run** to **Save**. Click **Save** to save two GeoPy macros with the same name entered for **Result File Name**:



- ***.py:** generates the video using the ***_status.py**. Execute this file to generate the video, by selecting **Macro - Execute Macro / Script** from the menu bar. In the Macro Execution Control browse for the macro and click **Run**.
- ***_status.py:** Includes the video generation parameters as a large Python macro containing the complete states of GeoDict for every rendered frame.

After clicking **Save** you can decide to open the first macro in the default text editor or not.



Note, that this creates and saves two Python files but does not render the video. However, this is useful if the video should be tweaked at a specific point or if animations should be added via script. To learn more about how to edit and play back GeoPy macros, see the [GeoPy Scripting](#) chapter.

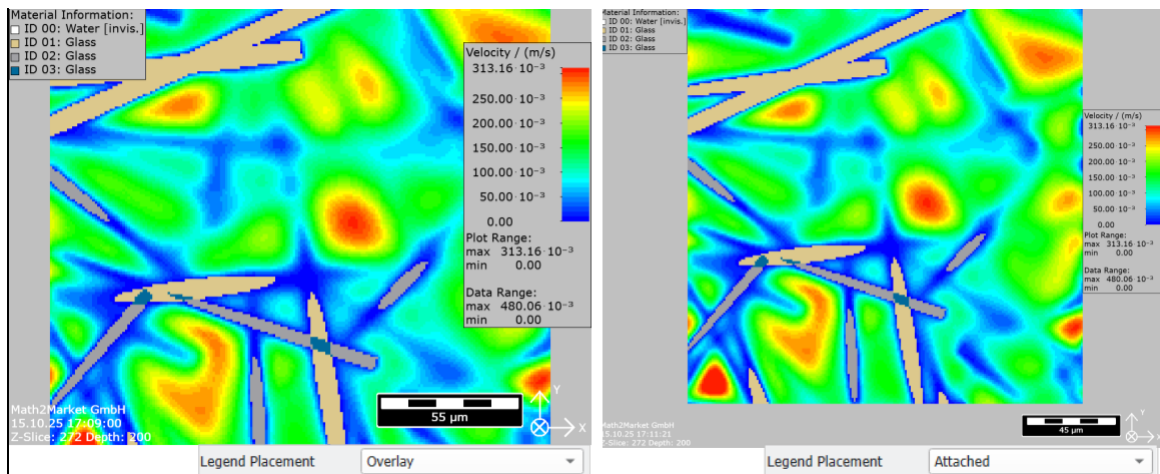


Note! This option is grayed out and thus not available for the presets **Follow Particle**, **Particle Animation**, **Back To Front (all slices)** and **Front To Back (all slices)**, because these presets are already Python scripts as explained [here](#) 

✓ Legend Placement

For 2D animations, additionally, the **Legend Placement** may be selected as **Overlay** or **Attached** from the pull-down menu.

If **Overlay** is selected, the legend elements are shown above the 2D slices, while for **Attached** the full slice is visible, as the legends are placed around the image.



This option is not available for the **(all slices)** presets. For these presets, the legends are placed as overlay by default.

✓ Run

After clicking **Run** in the **Export Video** dialog, the video is generated and saved to the current GeoDict project folder. Additionally, a result file (*.gdr) containing information about the video generation is created and placed next to the video file. The structure (*.gdt) is saved in the result folder.

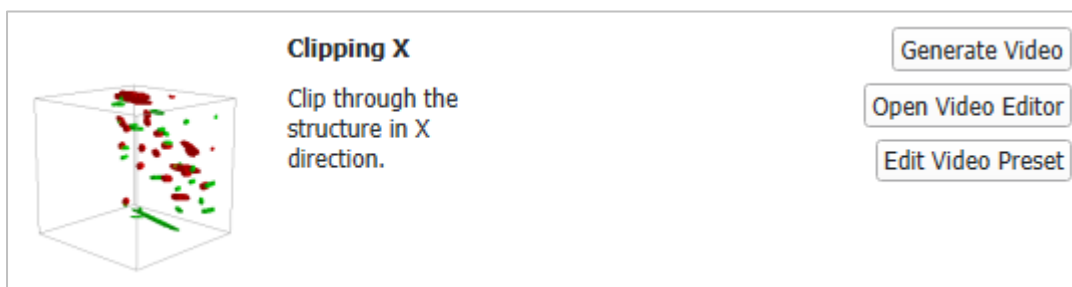
1.1.2 Video Presets

For 2D view and 3D view, several video presets are provided that let you generate great videos from the loaded microstructure by simply clicking **Generate Video**.

For each of these video presets, a **preview** is shown on the left-side of the panel. Checking or unchecking **Play Previews** at the bottom right of the **Create Video** dialog controls whether the previews are played or stopped.

In the middle of the panel, the name and a short description of the video preset are displayed.

The options [Generate Video](#)⁷, [Open Video Editor](#)²³, and [Edit Video Preset](#)¹² are available for each preset on the right side of the panel.



✓ Available Presets

Available Presets for 3D view:

- **Clipping X:** clip the structure in X-direction.
- **Clipping Y:** clip the structure in Y-direction.
- **Clipping Z:** clip the structure in Z-direction.
- **Fly-by:** let the structure fly into view from one side and disappear into the other side.
- **Follow Particle** : choose a particle and follow it on it's way through the structure.
- **Particle Animation** : animate the particles movement from a FilterDict or AddiDict simulation result.
- **Rotate X:** rotate the structure around the X-axis.
- **Rotate Y:** rotate the structure around the Y-axis.
- **Rotate Z:** rotate the structure around the Z-axis.
- **Streamlets:** animate streamlets visualizing the flow through the structure.



Important! For the **Follow Particle** and the **Particle Animation** video presets, the videos of animated particles are generated only if the structure *AND* the files containing the particles trajectories are loaded in the Visualization area in the GeoDict GUI as described [here](#) .

Available presets for 2D view:

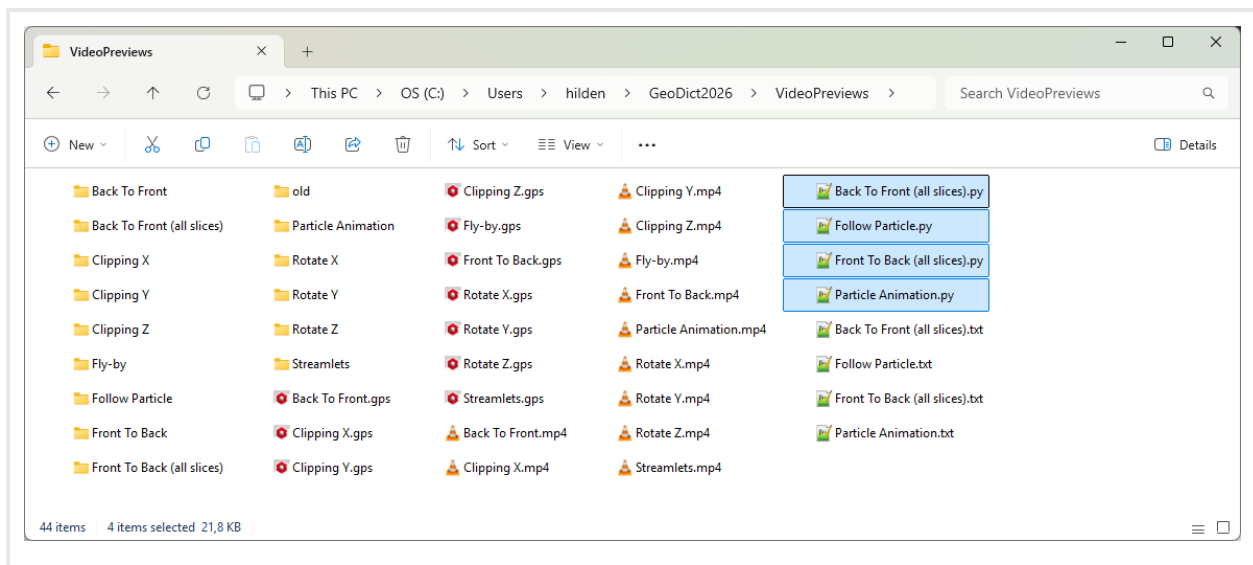
- **Back To Front (all slices):** slice through the structure starting at the last slice, using all slices of the current view direction.
- **Back To Front:** slice through the structure starting at the last slice of the current view direction.
- **Front To Back (all slices):** slice through the structure starting at the first slice, using all slices of the current view direction.
- **Front To Back:** slice through the structure starting at the first slice of the current view direction.

The video presets **Follow Particle**, **Particle Animation**, **Front To Back (all slices)**, and **Back To Front (all slices)** cannot be edited directly in the **Video Editor** dialog or in the **Edit Video Preset** dialog.

However, the Python scripts corresponding to these video presets can be found in the GeoDict settings folder and can be inspected with a text editor. Learn how to edit GeoPy macros in the [GeoPy Scripting](#) chapter.

The files corresponding to the other **Video Presets** can be found in the GeoDict settings folder (**C:\Users\%Username%\GeoDict2026\VideoPreviews**), together with the folders containing the images for the preview videos, the GPS (GeoDict Project Settings) files, which can be opened in the **Video Editor**, and the files for the previews.

Create Videos: Create Video Dialog



✓ Generate Video

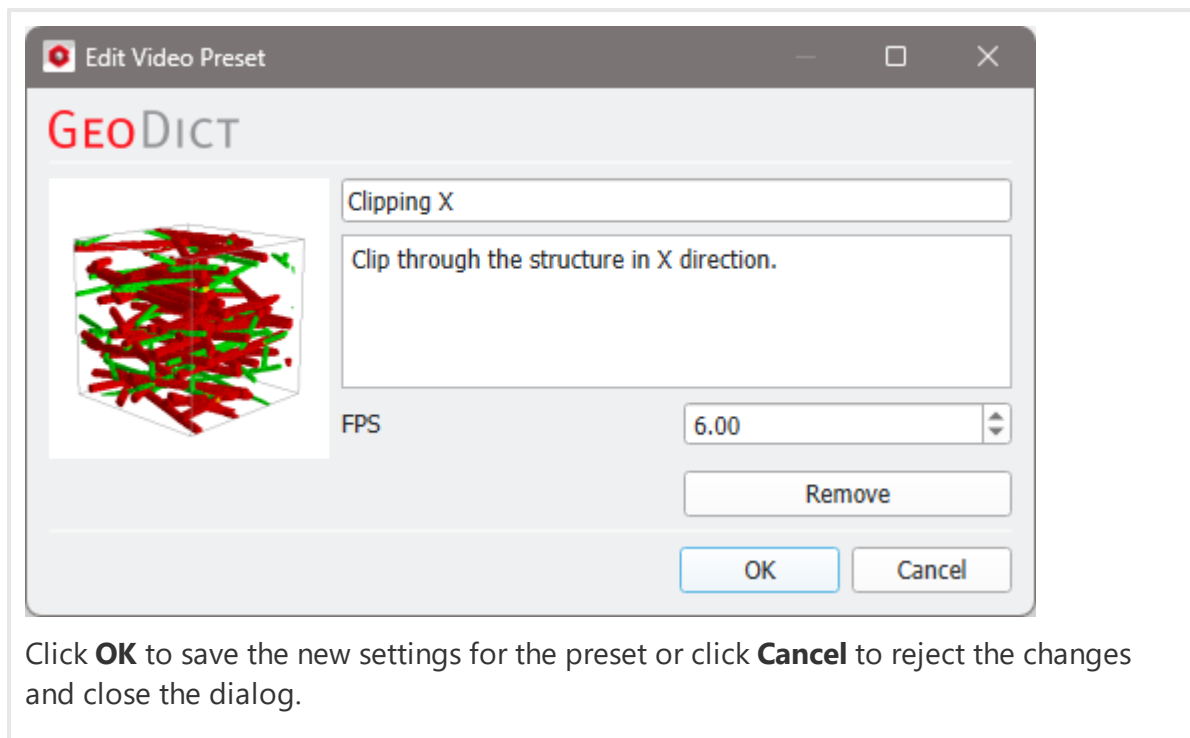
Clicking **Generate Video** opens the [Export Video](#) ⁷ dialog. The dialog has a good initial default setup for most videos. Select a **Result File Name** and click **Run** to generate the video. The animations shown in the preview are applied to the current structure displayed in the Visualization area of GeoDict.

✓ Open Video Editor

Click **Open Video Editor** to open and edit each video preset in the **Video Editor** dialog. A description of how to edit a video using the **Video Editor** is found [here](#) ²³.

✓ Edit Video Preset

By clicking on **Edit Video Preset**, the name, the description, and the playback speed of the preview (through **frames-per-second** or **FPS**) of the preset may be modified. Also, a preset can be removed from the list by clicking **Remove**.



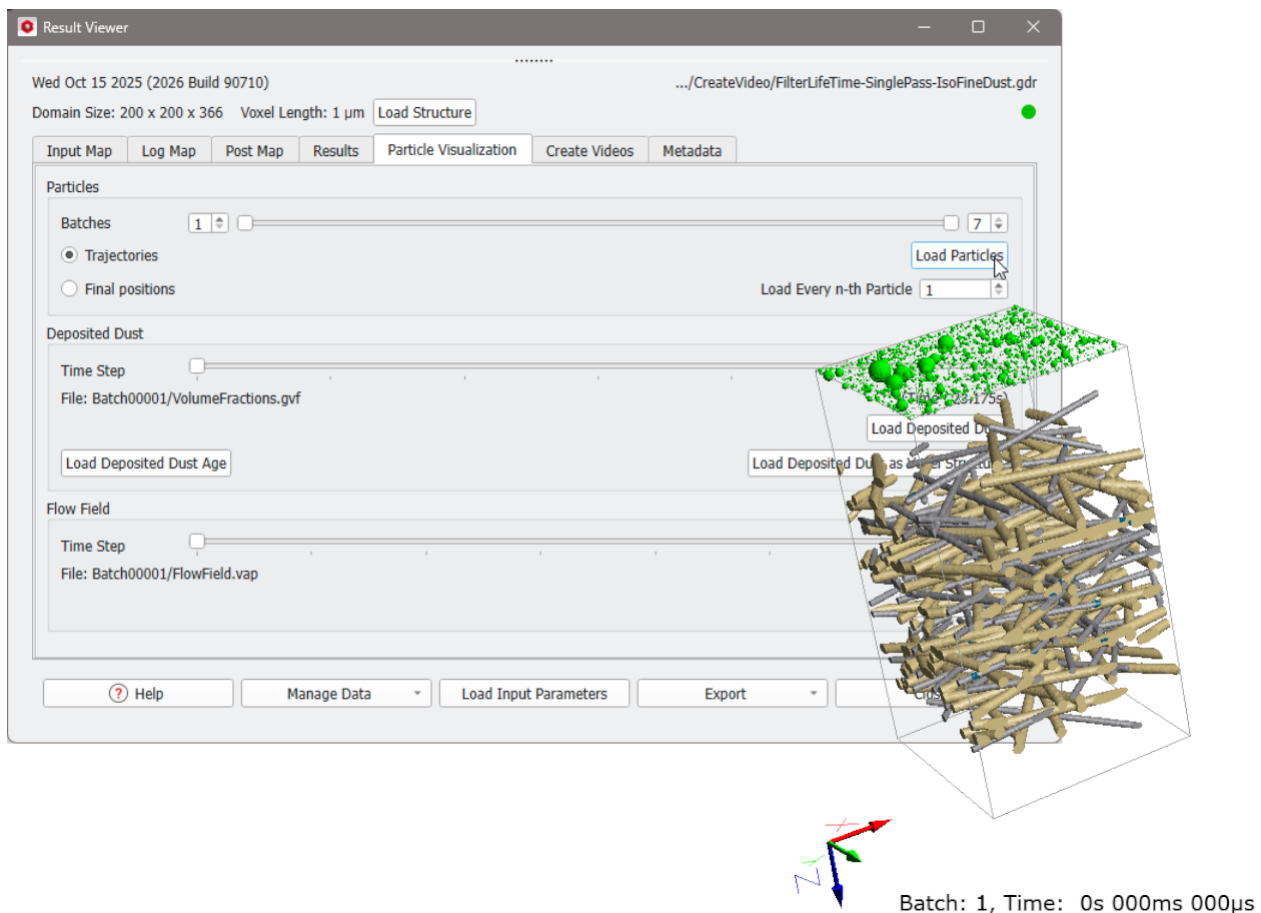
Particle Presets

For the **Follow Particle** and the **Particle Animation** presets, the workflow for the video generation starts with the opening of the **Result Viewer** of the result file (*.gdr) obtained from a FilterDict or AddiDict simulation.

For this, click the  icon in the toolbar or select **File** → **Open Results (*.gdr)....**

In the **Result Viewer**, first click **Load Structure** to load the structure into the Visualization area of GeoDict. Then, under the **Particle Visualization** tab, make sure that **Trajectories** is checked and click **Load Particles** in the **Particles** panel. It is possible to limit the number of batches and particles to be loaded (**Batches**, **Load Every n-th Particle**).

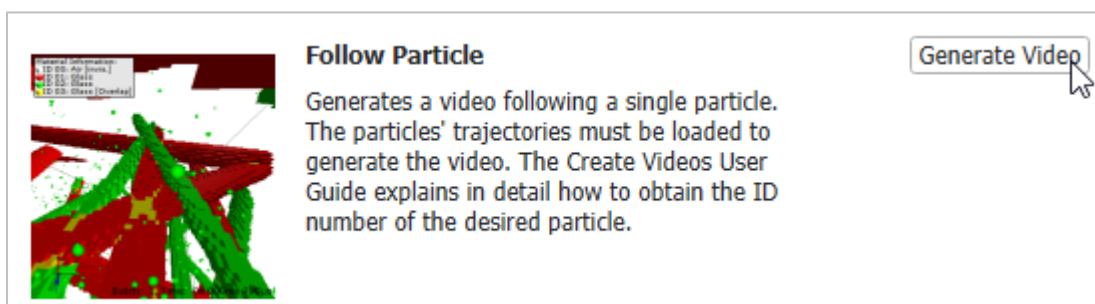
Create Videos: Create Video Dialog



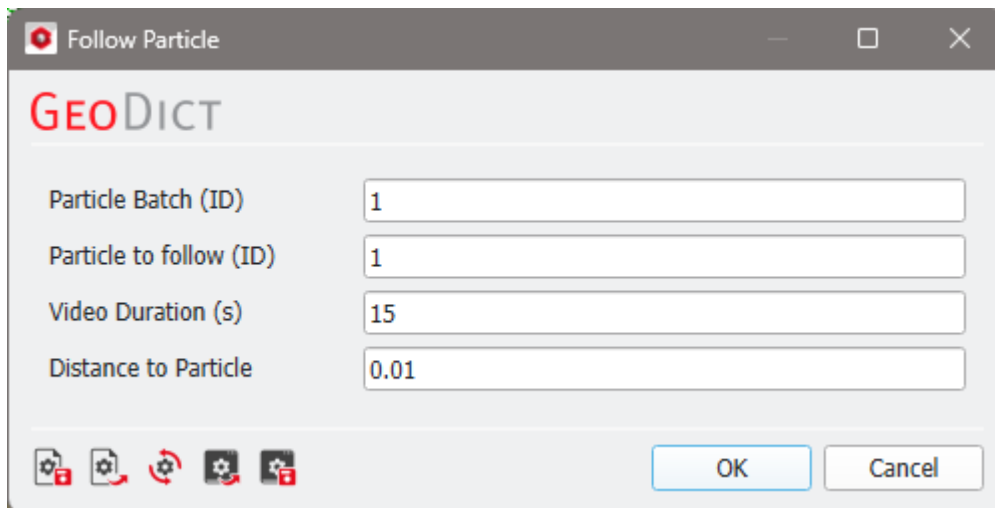
Click the  icon in the toolbar or select **File** → **Save Video as....** to use one of the **Particle** video presets.

In the **Create Video** dialog, click the **Generate Video** button for the desired preset video. Adjust the parameters in the [Export Video](#) dialog, and click **Run**. The respective particle dialog opens with particle specific animation parameters.

Follow Particle Dialog



For the **Follow Particle** video preset, an additional dialog opens after clicking **Run** in the **Export Video** dialog. In the **Follow Particle** dialog, the following parameters can be specified:



✓ Particle Batch

Enter the ID of the desired **Particle Batch**. In our example above, the result file contains results from 8 batches and the first three are loaded.

✓ Particle to follow

For **Particle to follow**, enter the ID of the particle the camera should follow. How to obtain this ID number is explained in the [example](#)¹⁵ below.

✓ Video Duration

Video Duration controls the length of the video in seconds. The smaller the number, the faster the particle flies through the structure.

✓ Distance to Particle

Distance to Particle defines the distance from the camera to the particle. The default distance is fine for most cases if the **Visualization - Diameter Factor** in the **Custom Particle Selection** dialog was not changed (see Visualization chapter). When the particle is large, increase the **Distance to Particle** to avoid having the camera “enter” the particle. The effect in this case is that the particle would appear as a ring instead of a sphere.

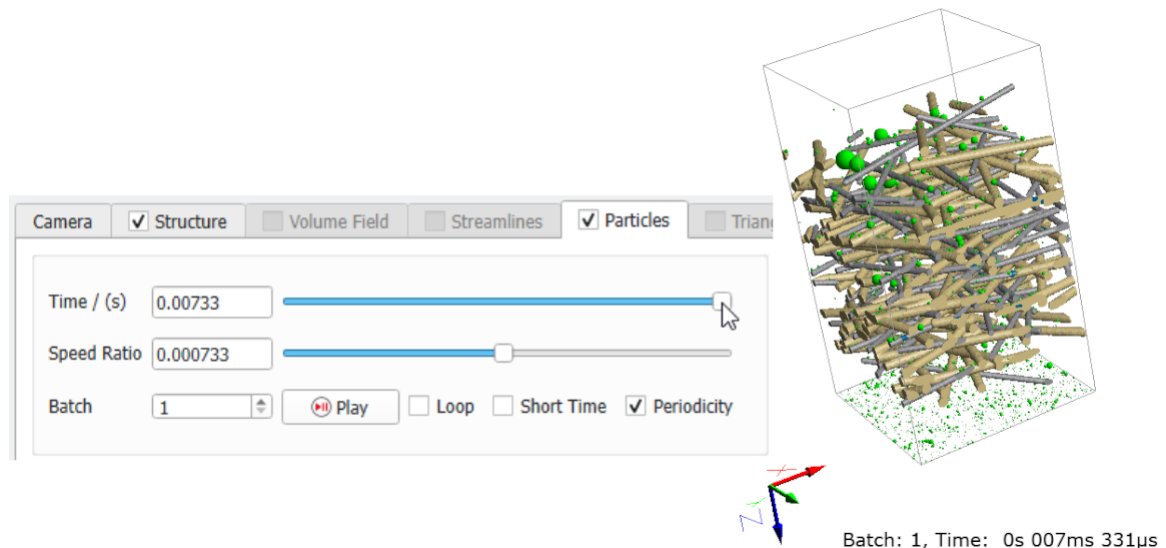
✓ Example

You may want to create a great video of a single particle moving through the structure. This could be a particle that is not filtered but runs from inflow region to the outflow region through a fibrous media. After having loaded the structure and the particles, it is possible to locate this individual particle to follow and obtain its ID.

Look at the **View Controls** above the **Visualization area** and do the following:

In the **Particles** tab, select the number of the **Batch**. This number will be later entered in the [Follow Particle](#) dialog as **Particle Batch**.

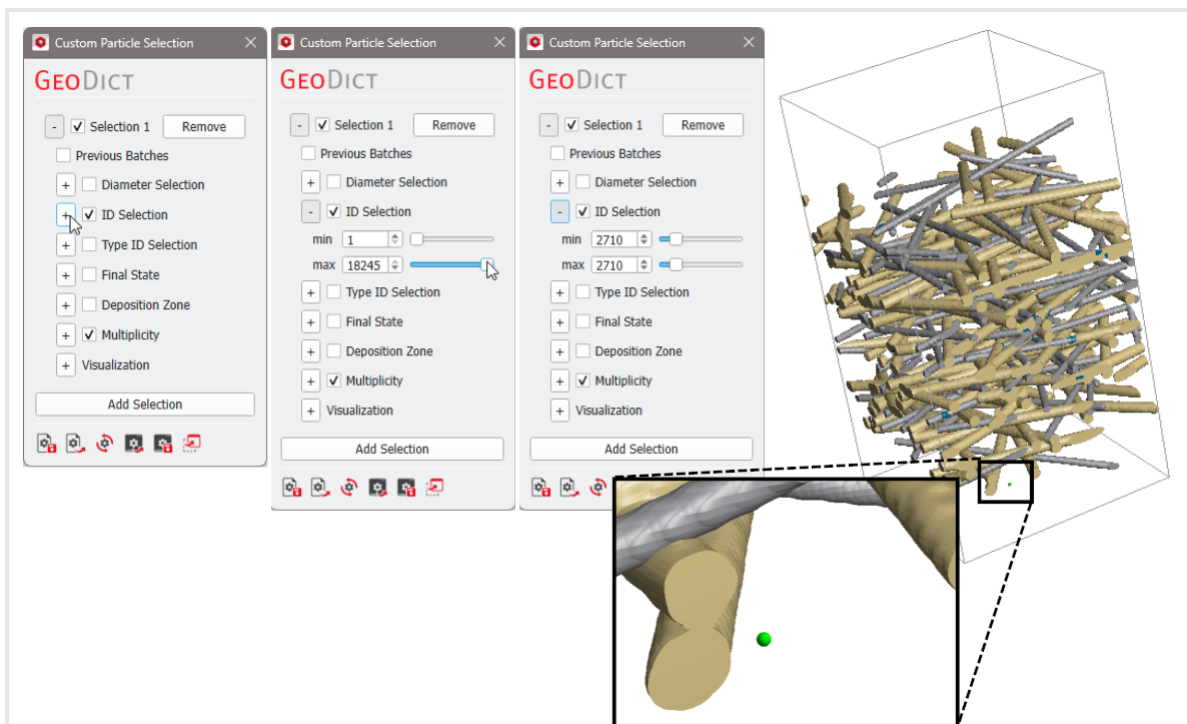
Move the **Time** slider all the way to the right to observe the position of the particles in the outflow region at the end of the batch.



From the **Particles** pull-down menu, select **Custom** and click **Edit Custom....** and in the opening dialog, click **Add Selection**. Click the **+** icon to unfold **Selection 1**.



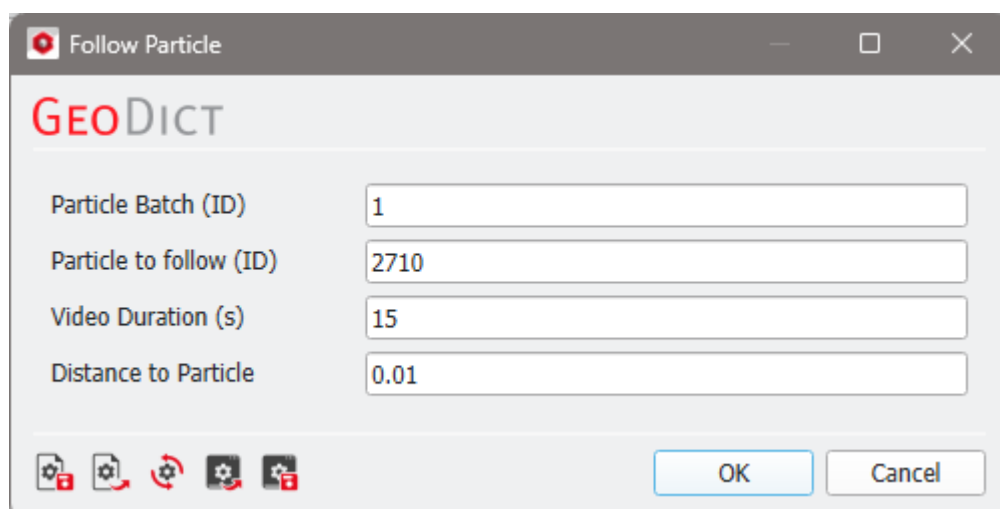
Check and unfold **ID Selection** and move the slider for max to the right until you can see some (good looking) particles in the outflow region, i.e., particles easily visible and around the center on the final position for the batch. Slowly move the slider for min (you can also directly insert numbers or click the up-arrow) and see how the particles start to disappear. Visually locate a single particle and adjust both sliders in this way until they show the same ID number and only this single particle can be seen above the microstructure in the Visualization area.



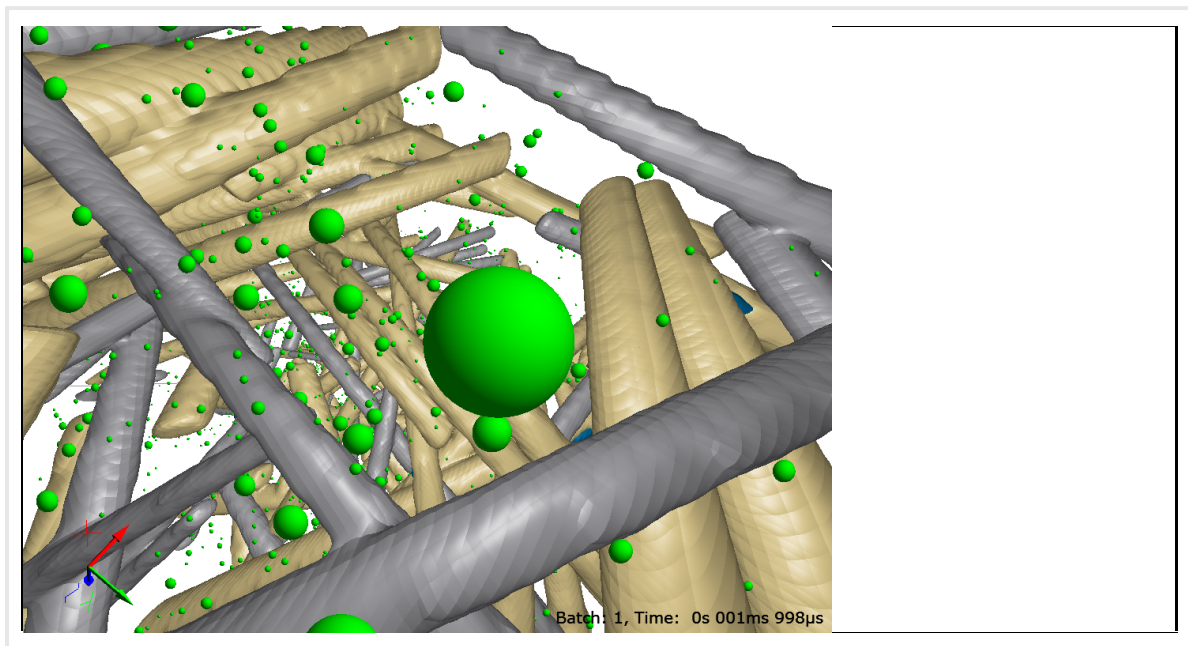
If also the other particles, and not only this individual particle, should be visualized in the final video uncheck **ID Selection** before going to the next step (in the Follow Particle dialog).

It is also possible to change the color of the single particle to make it stand out from the others. For more information on how to do this, refer to the Visualization chapter.

Back in the **Follow Particle** dialog, enter the **Particle Batch** as 1, the ID number of the selected **Particle to Follow** as 2710. Leave the **Video Duration** at 15 s or increase the time for a longer and slower animation. For larger particle sizes increase the **Distance to Particle**, for smaller particles decrease it. For our example the default value generates a good result.

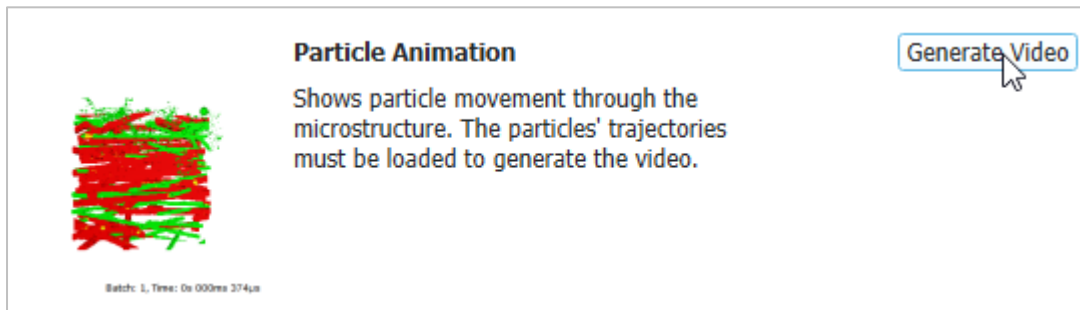


After clicking **OK**, the Python script is executed, and the video generated.



Particle Animation Dialog

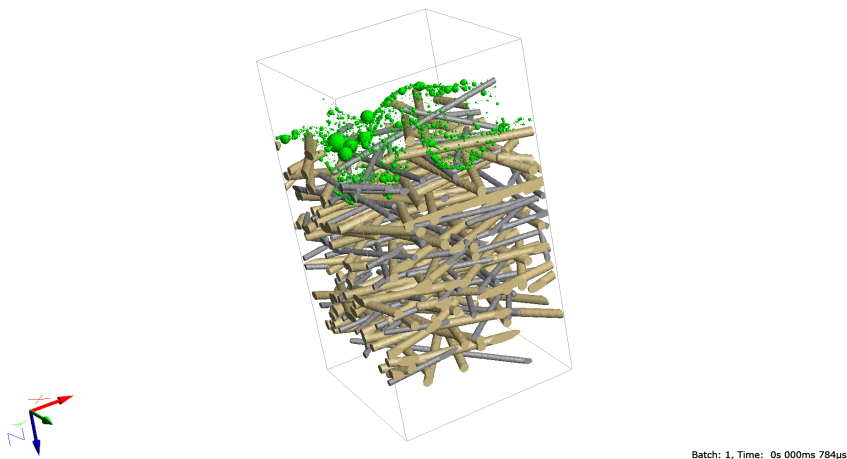
Also for the **Particle Animation** video preset, an additional dialog opens after clicking **Run** in the **Export Video** dialog.



In the **Video Generation** dialog, enter the **Seconds Per Batch** defining the time spent on each batch in the video and click **OK**.



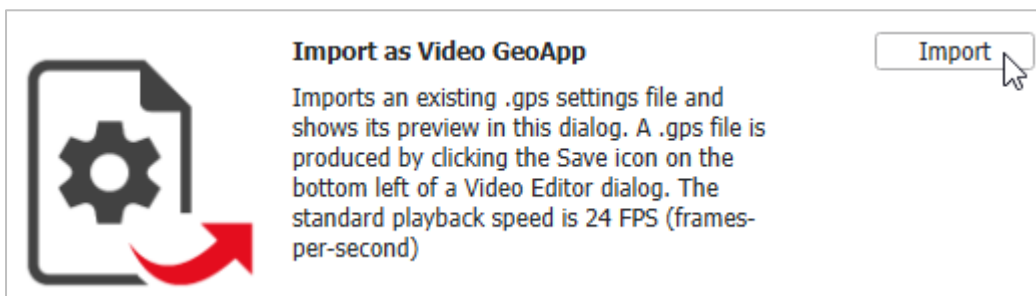
The video is generated and the corresponding result file is opened in the Result Viewer.



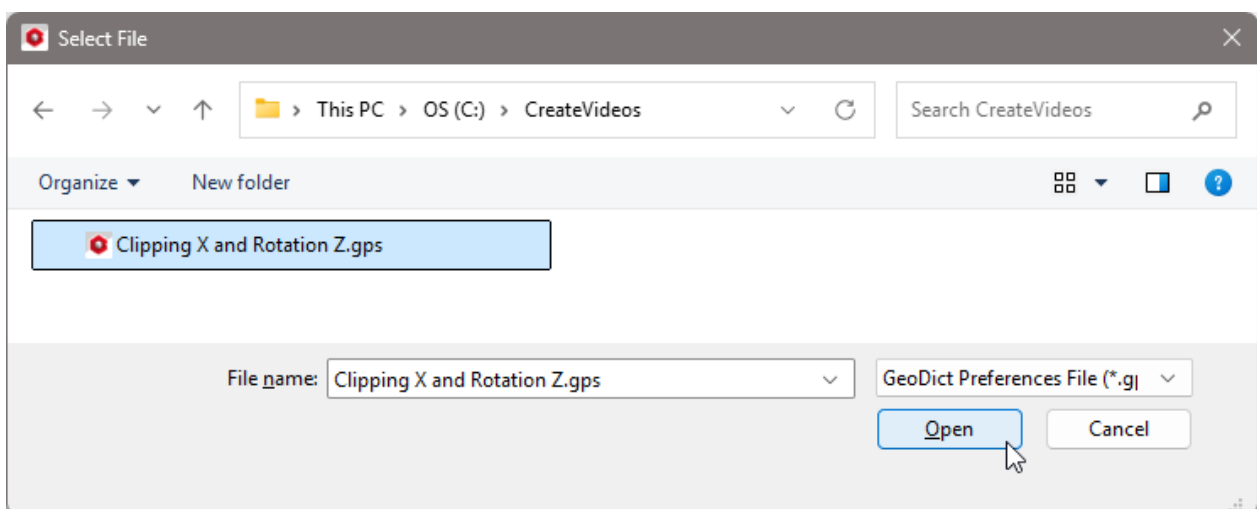
1.1.3 Import as Video GeoApp

Via the **Import as Video GeoApp**, your own video presets are added to the **Create Video** dialog and are displayed with their own preview.

A *.gps (GeoDict Project Settings) file saved from the [Video Editor](#)²⁴ is imported by clicking the **Import** button for the **Import as Video GeoApp** entry in the **Create Video** dialog.

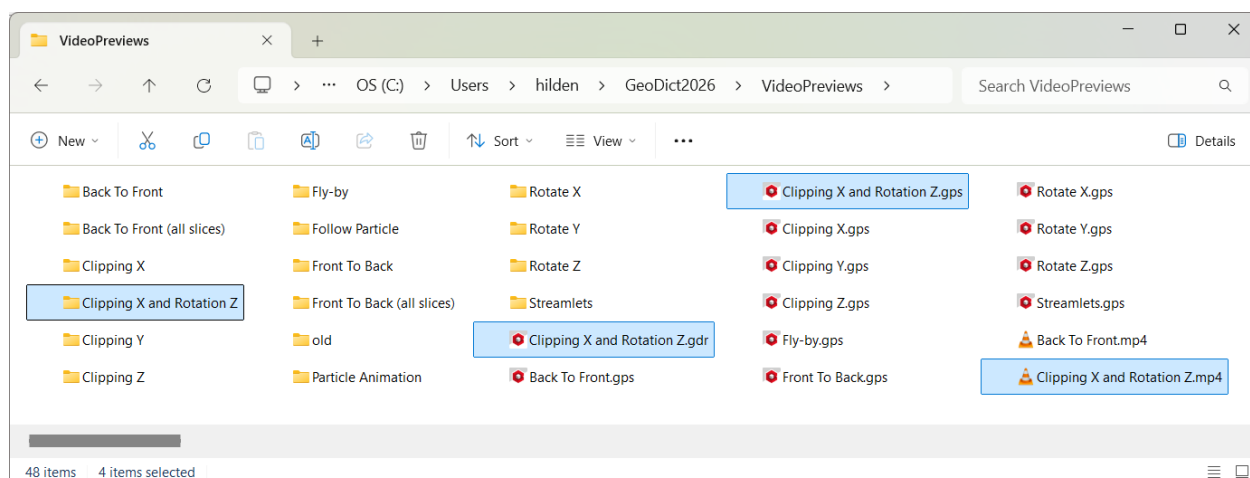


Select the saved *.gps file and click **Open**.

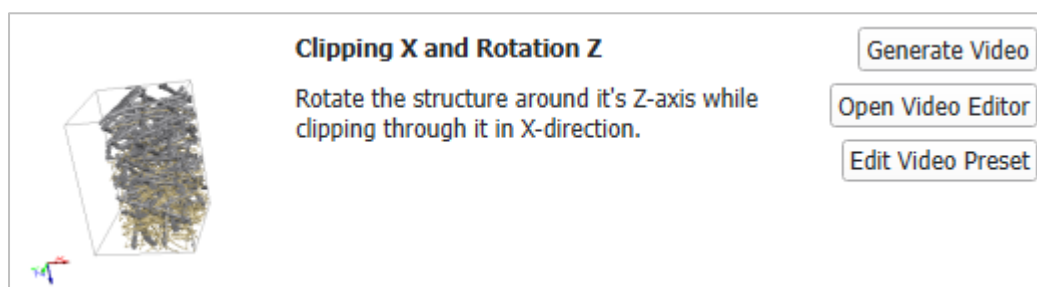


Afterwards, the selected animation is applied to the structure currently loaded to the Visualization area and the result file (*.gdr) of the video generation, the result folder

containing the images, the GPS file, and the *.mp4 file for the preview are saved in the GeoDict settings folder (C:\Users\%Username%\GeoDict2026\VideoPreviews).



After the video is created, the new video preset is available in the **Create Video** dialog list with its own preview. It can be modified or removed through the [Edit Video Preset](#)¹² button and its dialog. Here, a GPS file with the name **Clipping X and Rotation Z** was imported and a description was added via the [Edit Video Preset](#)¹² dialog.

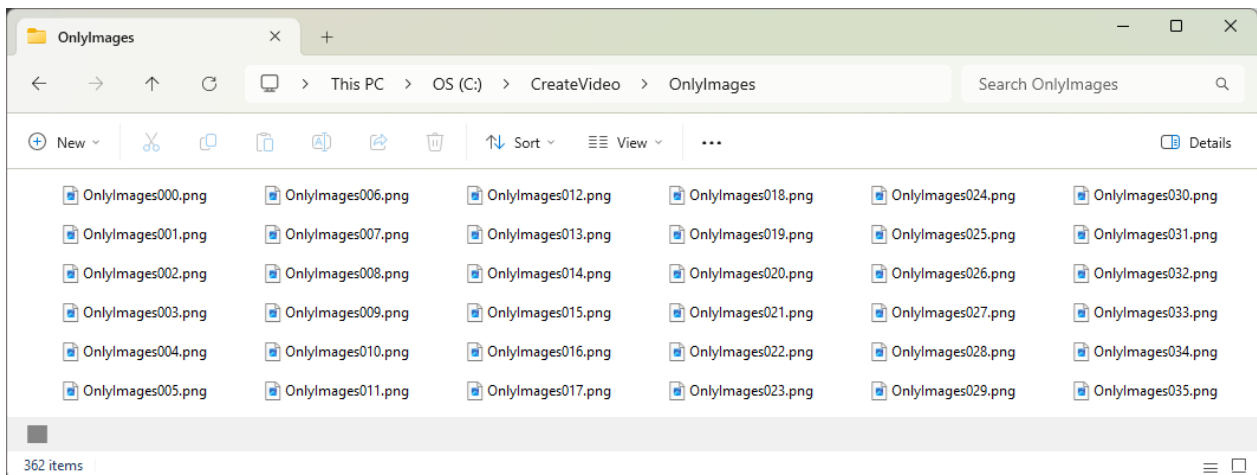


1.1.4 Create Video from Image Stack

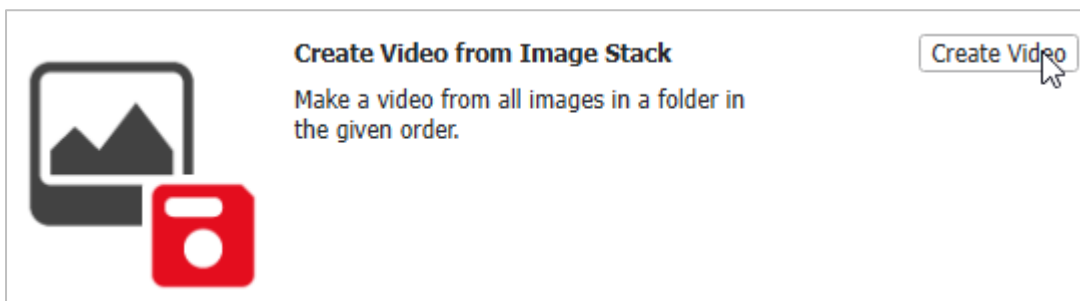
An existing stack of single frames is converted into a video using **Create Video from Image Stack**.

For example, if a video was generated with the [Keep Images](#)⁸ option checked in the [Export Video](#)⁷ dialog, creating a video from this image stack is done quickly with the possibility of changing other settings, such as the **Video Format** or the **Frames per Second**.

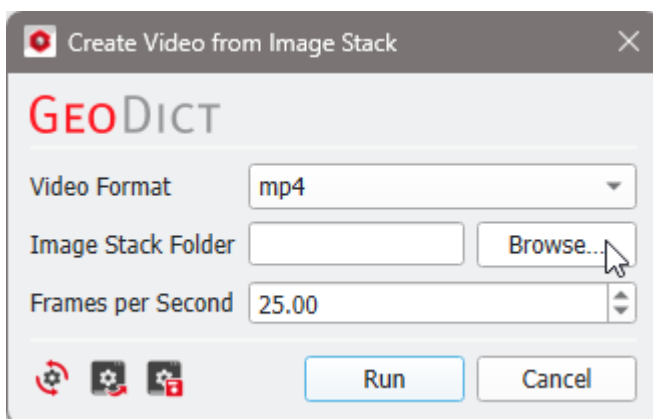
When creating your image stack you need to make sure that all images have the same name and a running number. This is important to control the order in which the images are combined to make the video. If the image stack was created as explained above, this is always the case:



Scroll to the **Create Video from Image Stack** entry in the **Create Video** dialog and click **Create Video**.

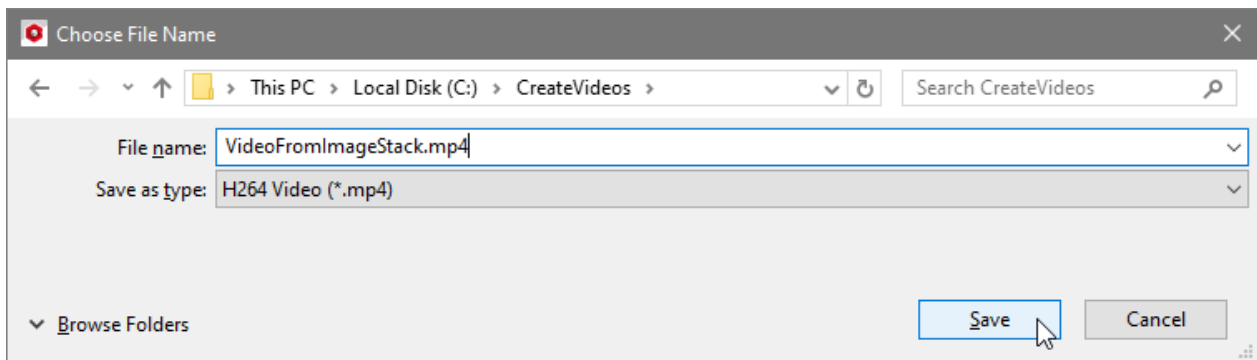


In the opening dialog, choose the **Format** of the video, and click **Browse ...** to search for the folder which contains the saved individual frames (**Image Stack Folder**). All images found in this folder are used for the video generation.



Clicking **Run** opens a dialog to choose file name and destination of the video. After clicking **Save**, the video is generated and saved to the specified file path.

Create Videos: Create Video Dialog



1.2 Video Editor

A large variety of possibilities to generate animations for videos is provided by the **Video Editor**.

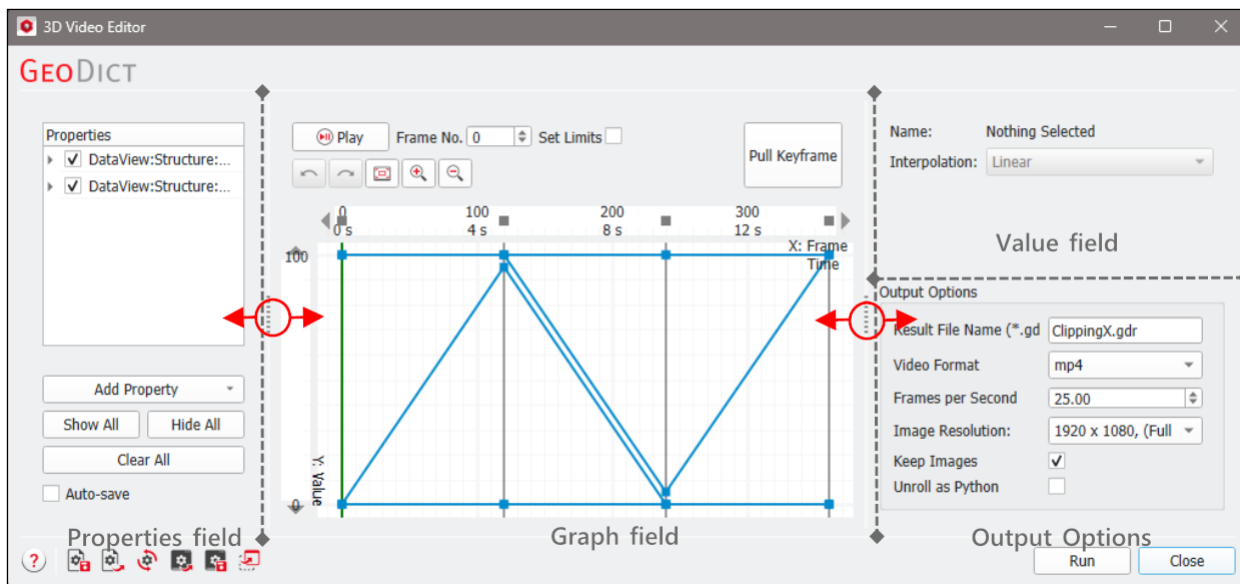
The **Video Editor** uses keyframes to animate a structure or object in a user-defined manner. In the animation, the objects can be made to change position, orientation, size, etc. Most parameters of the visualization in GeoDict can be animated in the **Video Editor**, allowing to present structures as desired.

It can be opened in three different ways:

- Clicking **Open Video Editor** to edit any of the video presets (via the Video Editor).
- Clicking **Open Current** to open the animation last edited or used for video generation in the current GeoDict session.
- Clicking **Open Empty** to start with an empty dialog.

The **2D Video Editor** opens from the 2D tab, and the **3D Video Editor** from the 3D tab, but only the 3D Video Editor is described here, since the options are the same.

As seen below, the 3D Video Editor dialog contains the **Properties field**, **Graph field**, **Value field**, and the **Output options**. The **3D Video Editor** dialog opens as a graph-editor that in the middle displays the flow and changes of the video on a 2D-graph (Graph field). The X-axis shows the time in frames and seconds and the Y-axis shows the values of the chosen parameters.



- On the left, in the [Properties field](#)^[25], you find the names of the properties corresponding to the plots in the Graph field.
- In the middle of the Video Editor, the [Graph field](#)^[28] contains a plot of the properties chosen in the Properties field. The curves are described by keyframes and data points, and display the changes of the properties over time.

- The options to be modified for a selected data point in the graph area are in the [Value field](#) in the upper right side of the Video Editor.
- Right below, find the **Output Options**. These are the same options shown when clicking **Generate Video** in the **Create Video** dialog, which opens the usual [Export Video](#) dialog.

The Video Editor fields can be collapsed and expanded by pulling the dotted lines in the left or the right, respectively.

Click **Run** to start the video generation. The video, result file, and result folder or Python macros, as defined in the **Output Options**, are placed in the current project folder.

Close the **Video Editor** by clicking **Close**.



Note!

Keyframe is a frame in time used to indicate the beginning or end of a change made to a property.

Data Point is a representation of a property on a keyframe which holds the current state of the property on the keyframe.

Any video consists of frames and the frames represent specific time values. A keyframe stores all visualization values at a specific time. For example, if a structure should be clipped in X-direction, it requires a start keyframe for the beginning of the clipping property and an end keyframe for the finish of the clipping property. The clipping property is then interpolated in the interval between those keyframes.

Save Settings

Check **Auto-Save** to save the current settings as start-up settings with each change. Then, the video settings are not lost after closing GeoDict and can be loaded again by opening the Video Editor with the option Open Current in the next GeoDict session or by clicking the Load Start-up Settings icon in the bottom left of the Video Editor.

Below the functionality of the icons located in the bottom left of the Video Editor dialog are explained:



Load the User Guide at this topic page.



Save the current animation settings into a GeoDict Project Settings file (*.gps).



Load animation settings from a previously saved *.gps file.



Load the built-in default settings.



Load previously saved start-up settings.



Save the current animation settings as start-up settings.

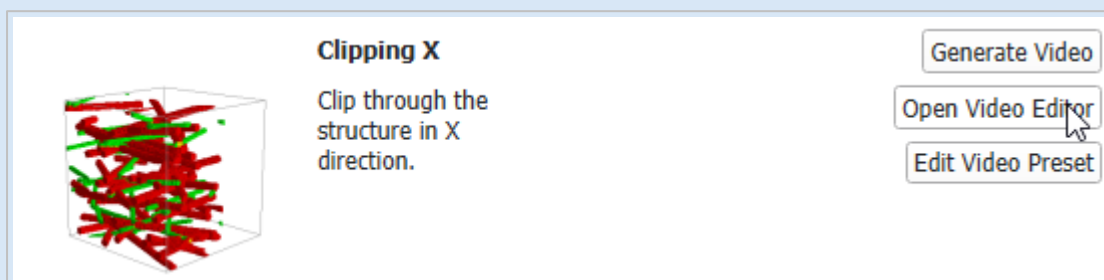


Raise the GeoDict main window (GUI).



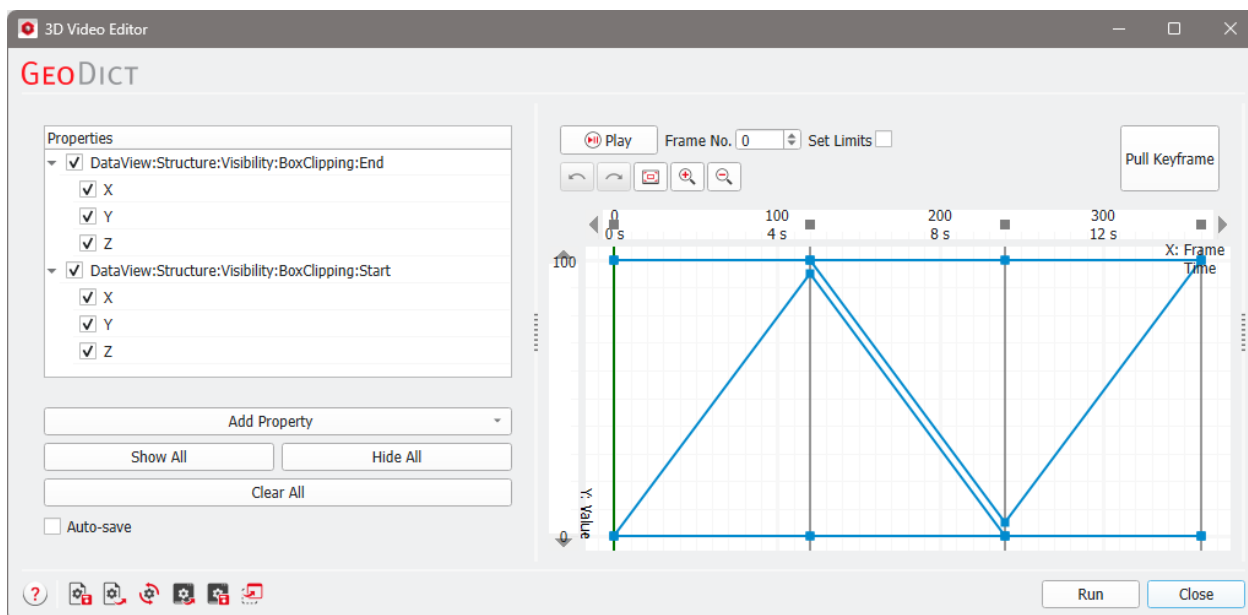
Note!

Here, as an example, we modify the video preset Clipping X to describe the Video Editor's options. Click **Open Video Editor** in the **Clipping X** video preset.



1.2.1 Properties Field

In the Properties field, two properties (considering the Clipping X video preset) are already displayed by default. If the Video Editor dialog was opened by clicking **Open Empty** in the **Create Video** dialog, the Properties field is empty, and no plot is displayed in the Graph field.



✓ Property Names

The long names of the Properties are also the path of the properties in the Visualization Settings panel in the GeoDict GUI and in the GeoPy script structure.

If [Unroll as Python](#)⁹ was checked in the **Export Video** dialog, the corresponding keys of the property are found in the resulting Python macro. Learn more about the visualization settings in the Visualization chapter and how to edit and play back Python macros in the GeoPy Scripting chapter.

✓ Show Properties in Graph Field

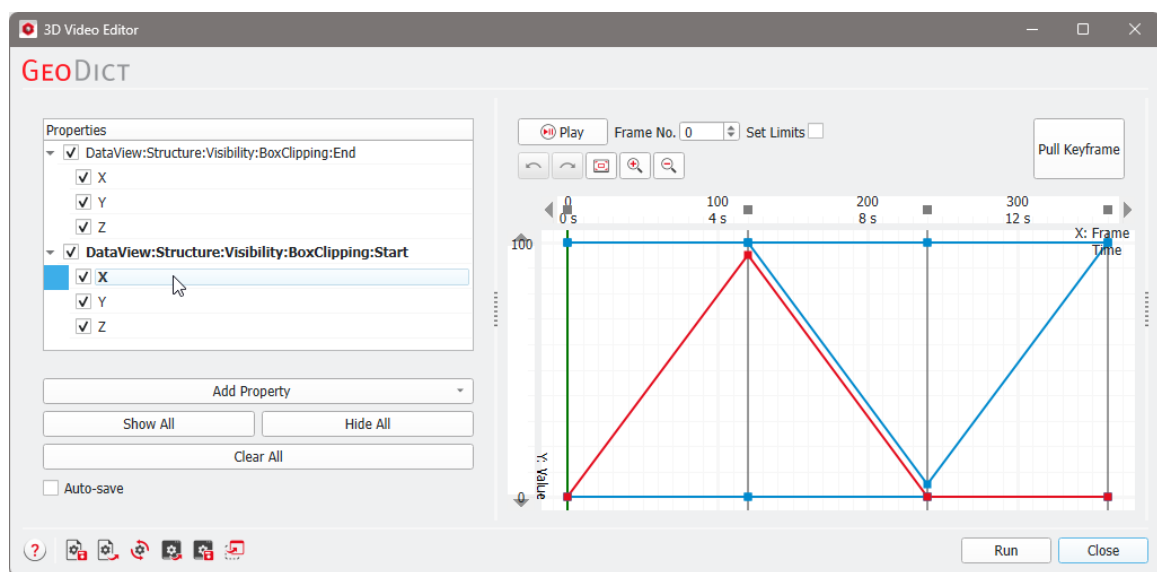
If the box on the left side of the Properties' name is checked, the corresponding curve is visible in the [Graph field](#)²⁸.

In the example, the BoxClipping:Start property defines the clipping in the corresponding directions (X, Y, Z) and the BoxClipping:End defines the clipping from the other sides, respectively.

Click the arrow on the left or double click on the property to unfold the sub-properties, if they are available. In this example, the different clipping axes are the sub-properties of BoxClipping.

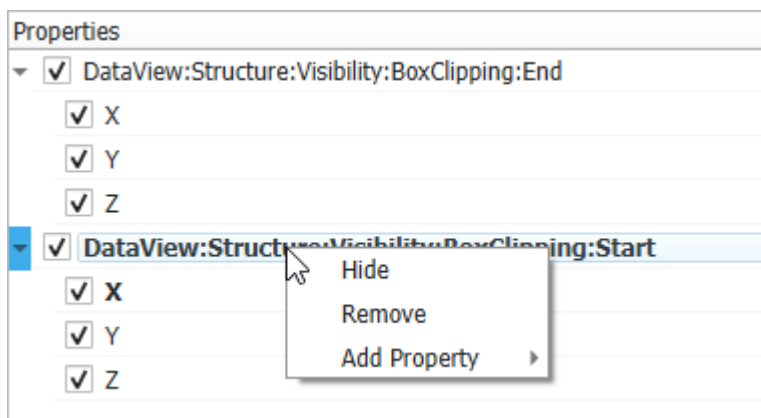
The sub-properties, boxes are also available for checking to show or hide the sub-property in the Graph field.

Clicking on a property in the Properties field highlights the selected property in the Graph field in red, to visualize its change of values over time.



✓ Right-Click Dialog

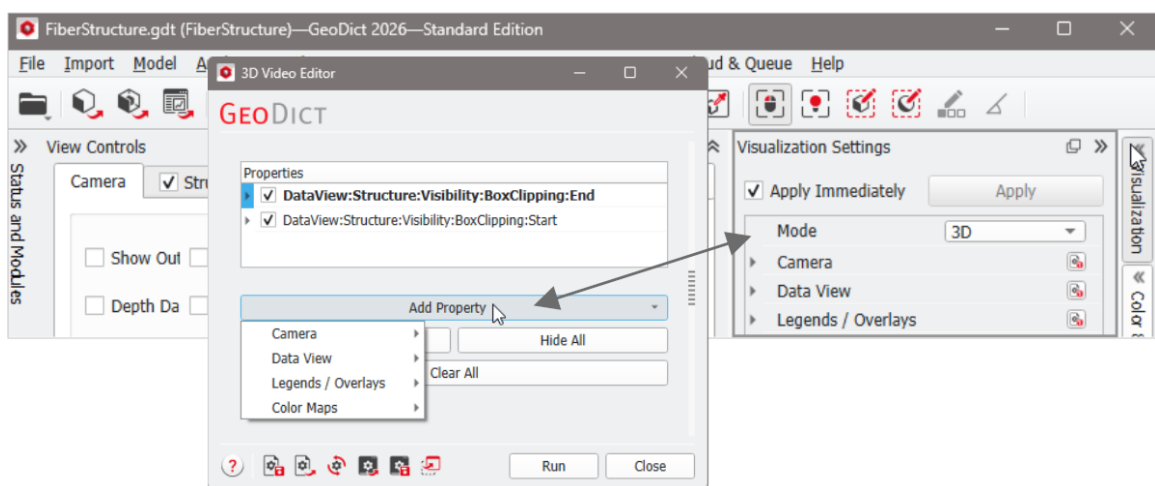
Right-clicking on a property opens a dialog providing the following options:



- **Hide (or Show):** Unchecks (checks) the property and thus, hides (shows) the corresponding graph in the Graph field.
- **Remove:** Removes the property from the Properties field, and thus also from the Graph field.
- **Add Property:** Adds a new property to be changed over time. More information about this option is given [below](#).

✓ Add Property

For **Add Property**, most of the visualization settings of GeoDict can be selected. They are organized corresponding to the **Visualization Settings** panel, that can be expanded and collapsed, on the right side of the Visualization area of the GeoDict GUI, accessible by clicking on the tab at the right. Learn more about these settings in the Visualization chapter.



Know how!

If working in the **2D Video Editor**, only **Properties** available for **Mode - 2D** can be added to the Video Editor. The other settings are grayed out.

When using the **3D Video Editor**, only properties available for **Mode - 3D** can be selected.

Properties available for both visualizations can be chosen for both editors.

The selected property is added to the Properties field and can be modified in the Graph field. An example for adding and editing a property is given [here](#) 

✓ Show All, Hide All, Clear All

Show All checks all properties in the Properties field to be shown in the Graph field.

Hide All unchecks all properties in the Properties field, resulting in an empty Graph field.

Clear All clears and deletes all properties along with all keyframes and data points.

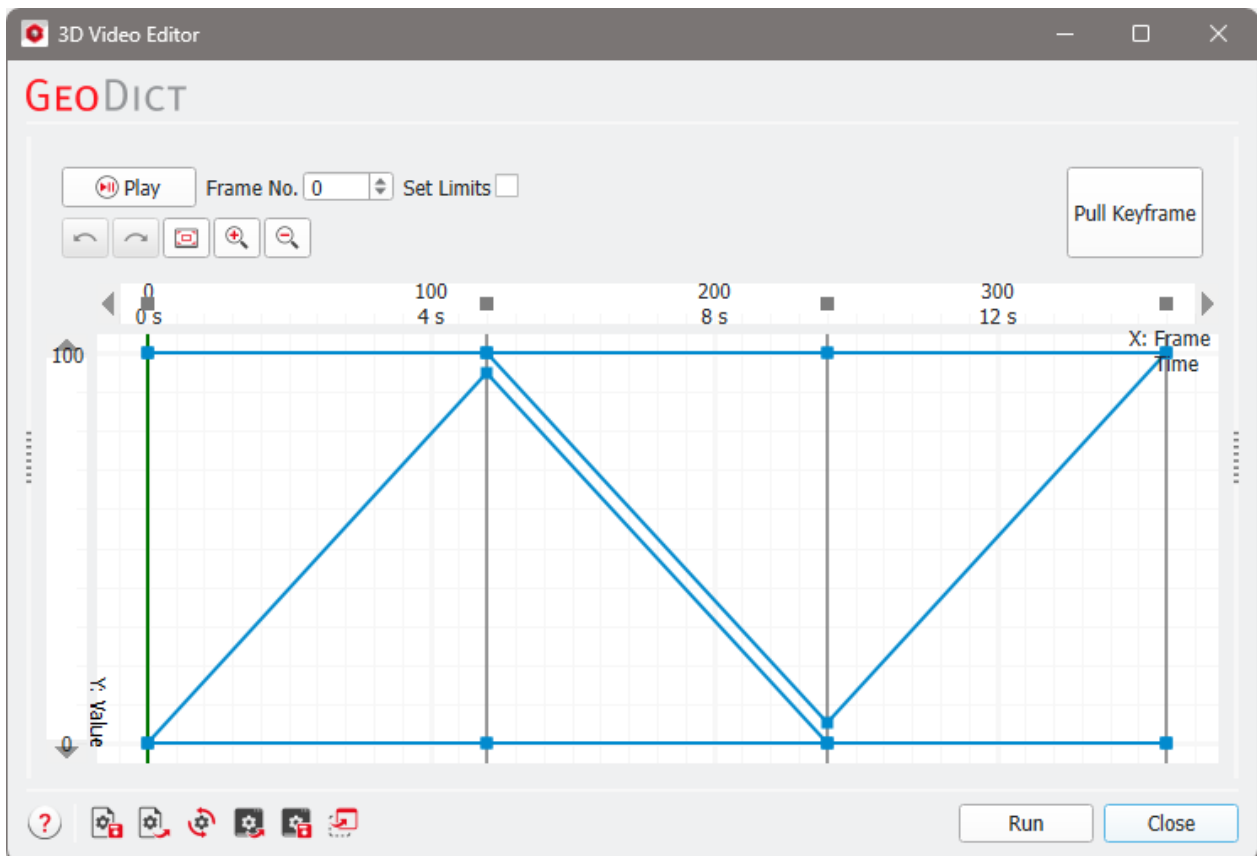
✓ Auto-Save

Auto-save: Check to save the current settings as start-up settings with each change. Thus, the video settings are not lost after closing GeoDict and can be loaded again by opening the Video Editor with the option Open Current in the next GeoDict session or by clicking the Load Start-up Settings icon in the bottom left of the Video Editor.



1.2.2 Graph Field

In the **Graph field**, keyframes and data points can be modified, created, deleted, and captured.



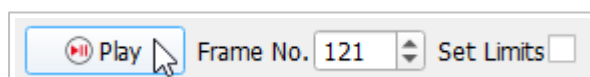
Zoom in and zoom out can be applied via the icons in the [Graph field toolbar](#)^[30] and by using the mouse wheel while the cursor is inside the plot of the Graph field. Then the zoom uses the cursor as its center and zooms in and out of its position in the plot of the Graph field.

Hold the right mouse button and move the cursor inside the plot of the Graph field to move around the view.

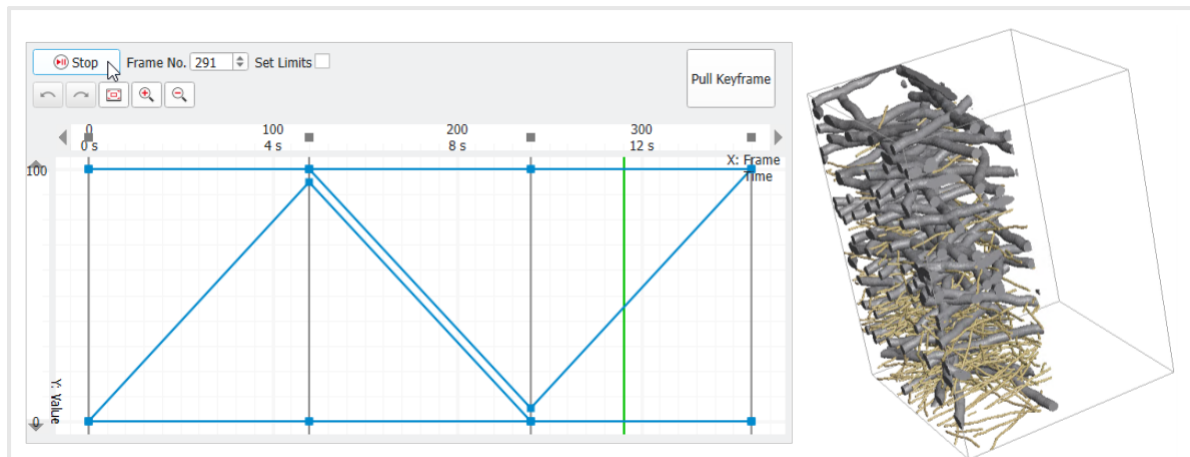
If only one axis should be affected, hover the mouse over the value range of the axis and use the mouse wheel to zoom, or the right click to move, just on this axis.

✓ Preview Options

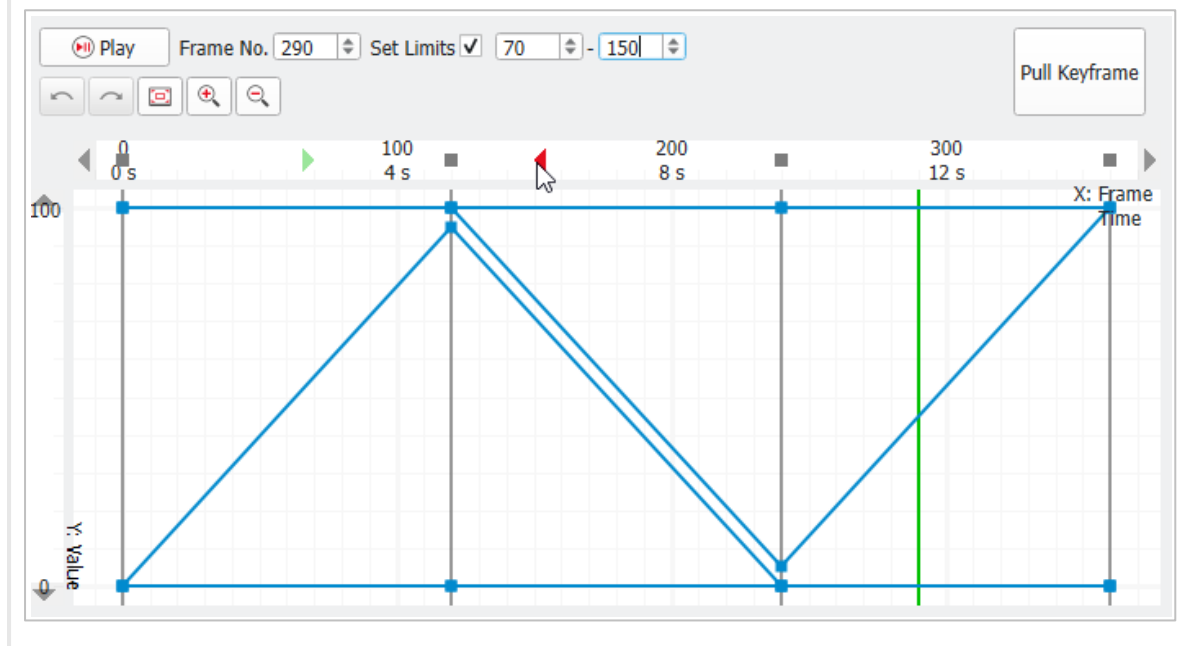
At the top of the Graph field, by clicking the **Play** button, the animation defined in the Graph field from the first keyframe to the last keyframe is played in the GeoDict Visualization area.



The frame of the animation is displayed in the plot of the Graph field by a vertical green line, the playhead, that moves along the X-axis. It can be set manually by left clicking on the X-axis in the Graph field, or by entering the desired frame number for **Frame No.** above the plot. This also updates the GeoDict's Visualization area. Click **Stop** to end the playback.



If only a small part of the animation should be played in a loop, check **Set Limits** and enter the desired limits or move the starting arrow (▶) and the end arrow (◀) on the X-axis to the desired positions. In the example below, clicking **Play** will only play the frames 70-150 back. This option does not affect the final video rendering when clicking on **Run**.



✓ Graph Field Tool Bar

Below the play options, several buttons control the view of the graph as described here:



Undo an action.



Redo an undone action.



Center view, via zooming in or out of the plot in the Graph field, resulting in all unhidden curves being in view.



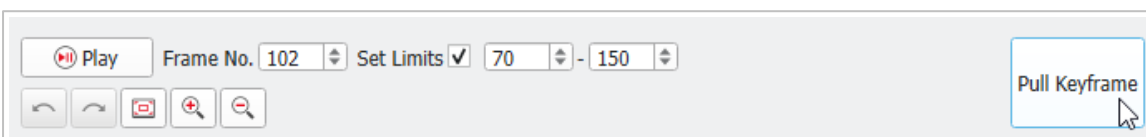
Zoom-in into the plot of the Graph field.



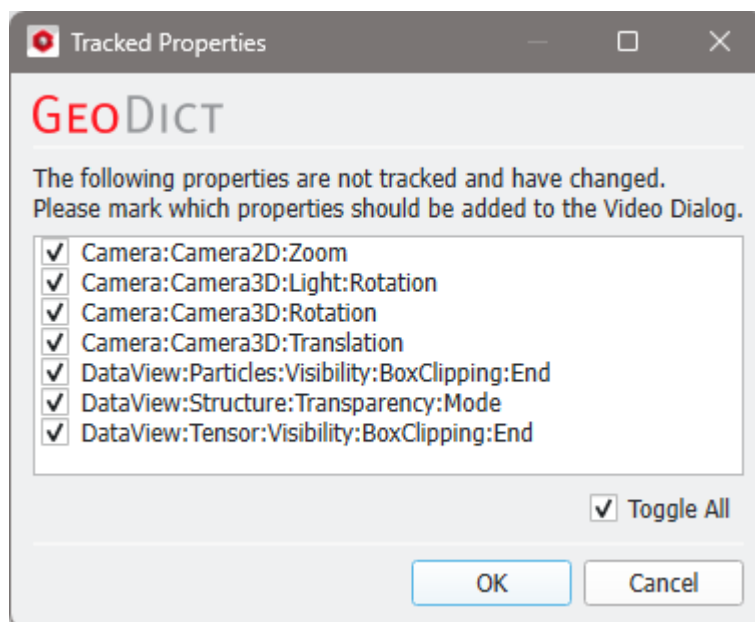
Zoom-out of the plot of the Graph field.

✓ Pull Keyframe

The button **Pull Keyframe** is found in the upper right corner of the Graph field.



Pull Keyframe reads the current state of the Visualization area in the GeoDict GUI and transfers it into the Graph field. If a property has changed but is not recorded in the Properties field, GeoDict gives you the possibility to add it. The new keyframe is then inserted at the playhead's position. An example of pulling a keyframe from GeoDict is given [here](#) ⁴⁰.



If no property was changed, still a new keyframe is added at the playhead's position, containing interpolated data points for all properties in this plot section.

✓ Edit Keyframes

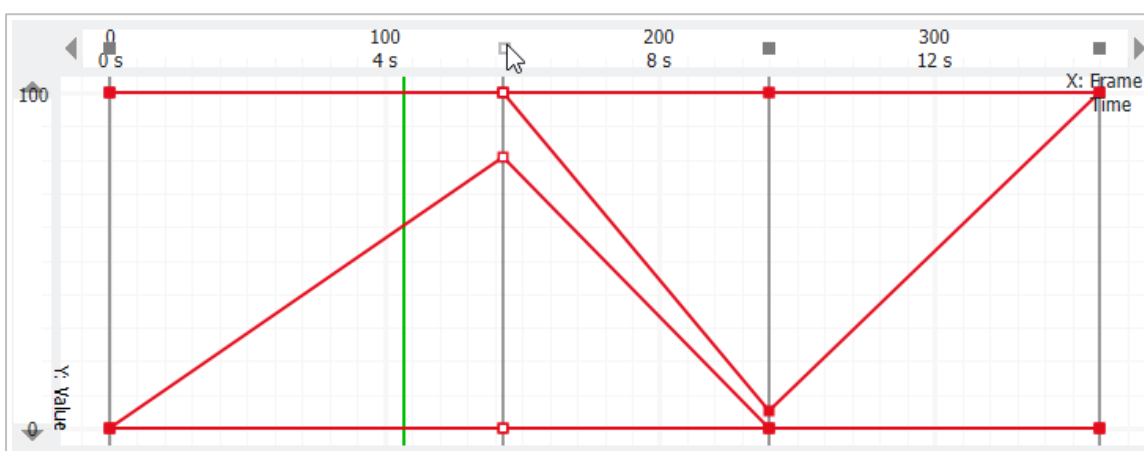
On the X-axis, which represents the time in frames, (in this example) markers can be found at frames 0, 120, 240 and 360. Those markers are keyframes and are shown as a

small dark gray box on the X-axis and a dark gray line in the plot of the Graph field. If the Video Editor was opened by clicking [Open Empty](#)²³, there are no keyframes.

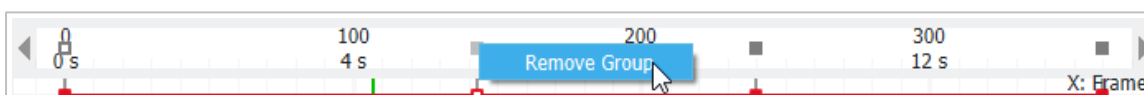
Keyframes are groups that contain the data points, represented by small blue or red boxes on the keyframe lines.

A keyframe can be selected by left clicking on the small dark gray box on the X-axis. If the keyframe is selected, this box is marked white. Also, all data points on the selected keyframe are selected automatically.

By left clicking and holding, you can change the position of the keyframe in time. Move the cursor left or right to decrease or increase the number of keyframes used for the last keyframe field. Moving the last keyframe also changes the total number of frames used for the animation.



To remove a keyframe, right-click the keyframe marker on the X-axis to call its options menu and select **Remove Group** to delete it.

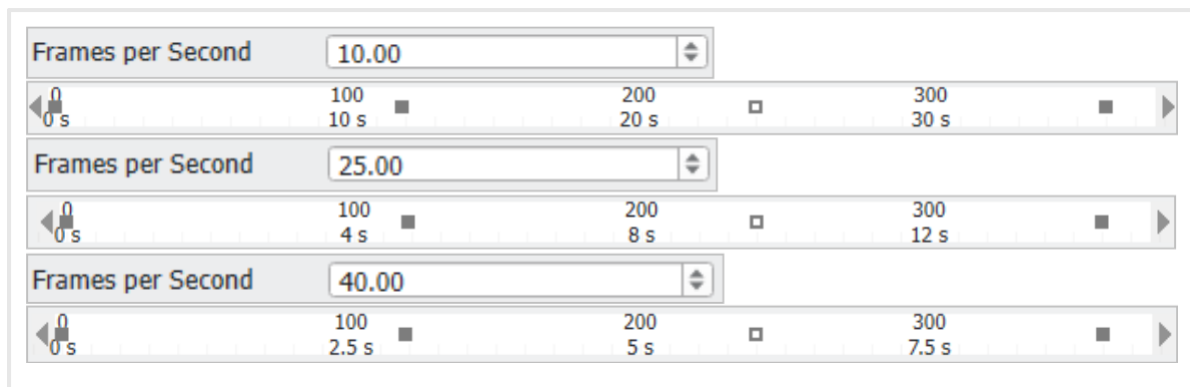


✓ Time Line - X- Axis

The X-axis represents the time in frames.

A standard animation runs at a speed of 25 FPS (frames-per-second). Due to this, for example, for an animation that lasts 4 seconds, the properties need to be set over 100 frames.

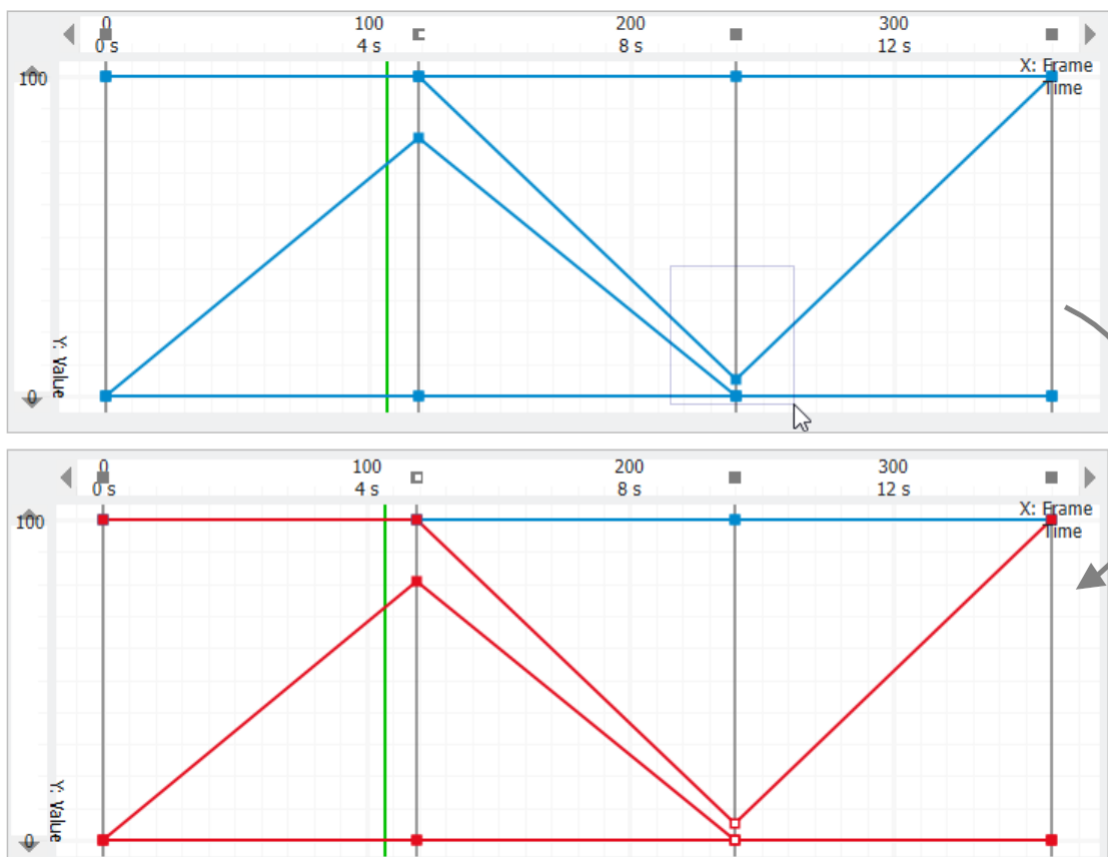
However, the **Frames per Second** can be changed on the right in the **Output Options** panel. Observe how the time values change in the X-axis of the plot in the Graph field for different FPS values.



✓ Edit Data Points

To select a data point of a property on a keyframe, left click on the blue or red box which represents the data point. The selection status of the data point is indicated by displaying a smaller white box inside its box. Also, the data point shows up in the [Value field](#)³⁵ with its name, frame, value, and interpolation type.

Multiple data points can be selected by drawing a multiselect rectangle. To do so, click and hold the left mouse button in the **Graph field** and draw a box around the desired data points. All data points within the box are then selected. Change frame and interpolation in the [Value field](#)³⁶.

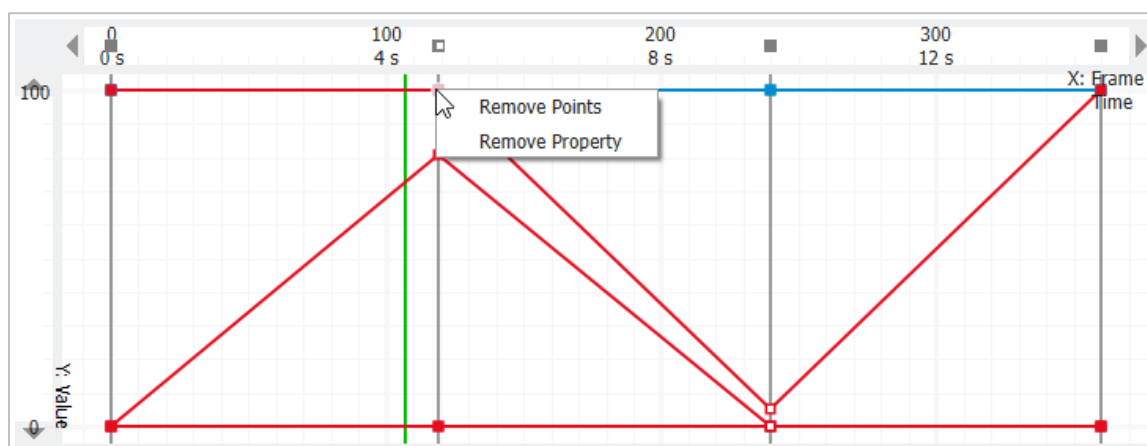


Considering only one data point, the value and frame can be alternatively changed by selecting it and holding down the left mouse button. Then, move the cursor up and

down along the keyframe to raise or lower the value or move the mouse left and right to change the timing or frame of a data point. This automatically creates a new keyframe if there is none at the chosen time or attaches it to an existing keyframe.

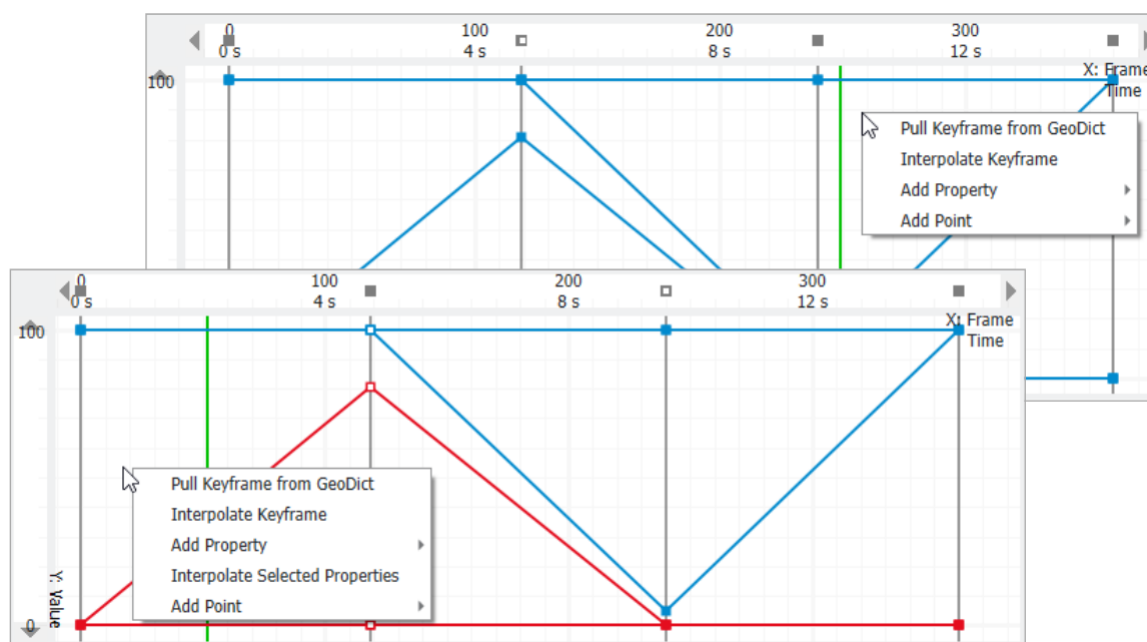
Right clicking on a data point offers the following options:

- **Remove Points:** Removes the data point beneath the right click. If multiple data points are selected, all these selected data points are deleted.
- **Remove Property:** Removes the property and all its data points beneath the right click. Multiple selection does not have an effect here.



✓ Right-Click Dialog

The following options are available by right clicking in the plot of the Graph field:



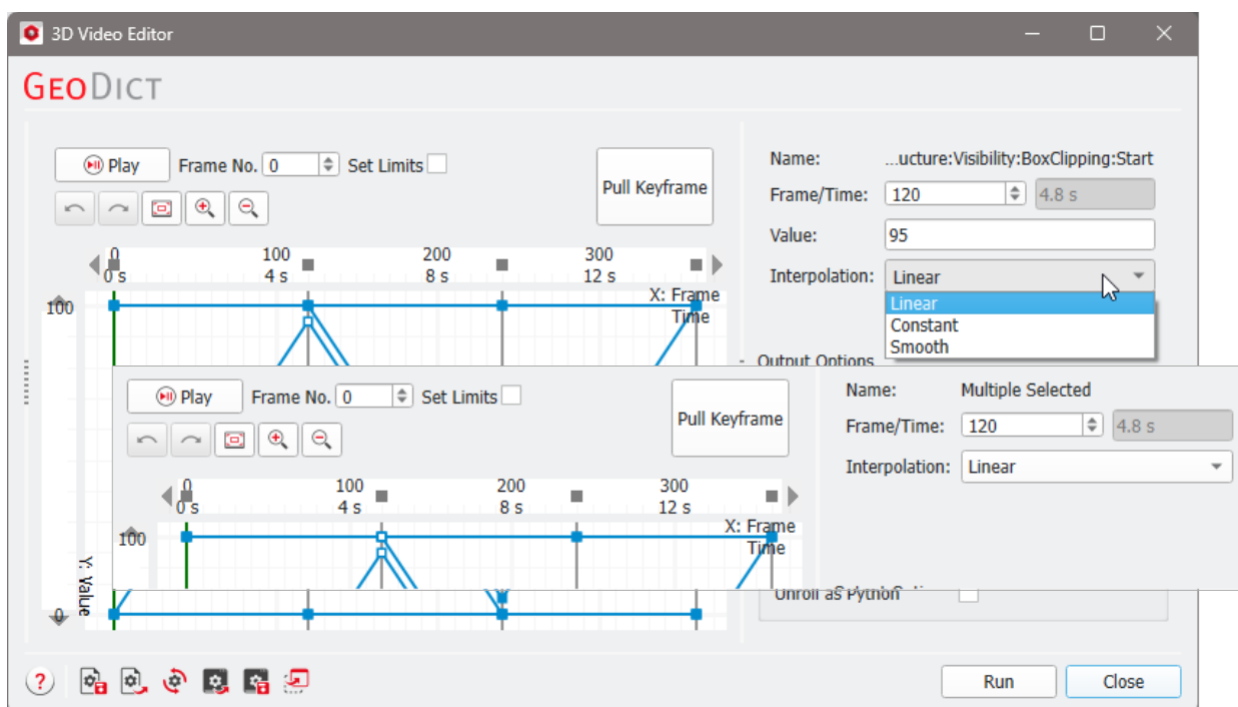
- **Pull Keyframe from GeoDict:** Reads the current state of visualization in the Visualization area of the GeoDict GUI and transfers it into the plot of the Graph field.

If a property has changed but is not recorded in the Properties field, GeoDict gives you the possibility to add it. The new keyframe is inserted at the position of the right-click.

- **Interpolate Keyframe:** Adds a keyframe at the mouse position. The new data points of the properties on this keyframe are calculated through interpolation between the data points before and after.
- **Add Property:** Adds a property in the Properties field.
- **Interpolate Selected Properties:** Adds a keyframe at the mouse position. The new data points of the selected properties on this keyframe are calculated through interpolation between the data points before and after. This option is only available if one or more properties are selected.
- **Add Point:** Adds a single data point of a selected property. The value of the data point is interpolated. If no keyframe is present at this X-axis frame, a new one is created.

1.2.3 Value Field

The **Value field** enables you to enter exact values for keyframes and data points. It distinguishes between selecting a single or multiple data points.

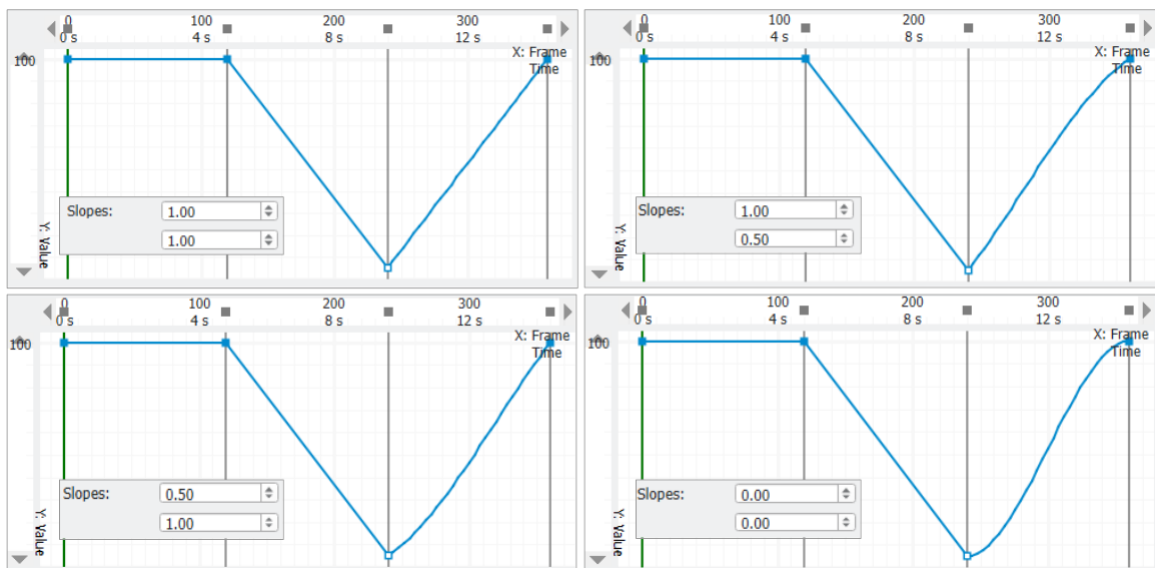


✓ Select a Single Data Point

If a single data point is selected, the following options are available in the **Value** field:

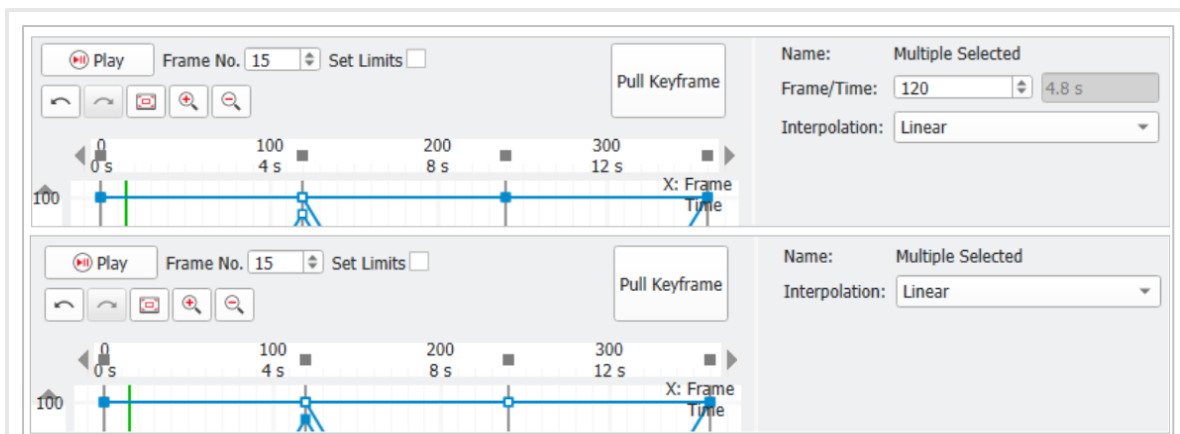
- **Name:** The name of the property selected with this data point.

- **Frame/Time:** The frame of the data point on the X- / Time axis can be entered, and the corresponding time is computed automatically, depending on the selected frames per second in the Output Options.
- **Value:** The value of the data point on the Y- / Value axis.
- **Interpolation:** The type of interpolation for this data point. The types available for Interpolation are:
 - **Linear:** Linear interpolation of values between the selected data point and the next one.
 - **Constant:** The values of a data point will be constant until a new data point is reached.
 - **Smooth:** The values between the selected and the next data points will be calculated for a smooth transition. Define the left and right Slopes of the spline. If both slopes are set to 0, the tangential at the selected points is horizontal. Setting both values to 1 leads to straight lines between the points and thus, is the same as linear interpolation.



✓ Select Multiple Data Points

If multiple data points are selected, the **Name** is **Multiple Selected** and the **Value** field will display different options that can be modified, based on the context of the data points.



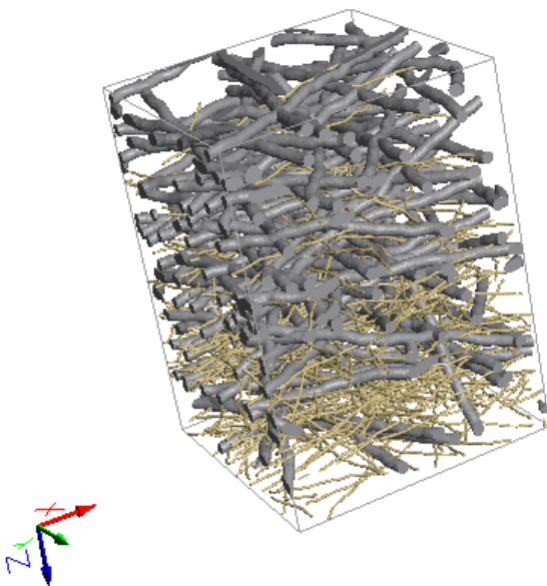
Multiple data points on the same Keyframe: If multiple data points have been selected and they all share the same keyframe, **Frame** and **Interpolation** can be changed in the value selection. All data points share the same frame since they share the same keyframe. If **Frame** is changed, all selected data points will be modified. If the data points have the same Interpolation applied, the interpolation will show the specific interpolation type. Else, it will show the type Mixed. Changing the interpolation type will apply to all selected data points.

Multiple data points on different Keyframes: If multiple data points have been selected on different keyframes only the **Interpolation** type can be changed.

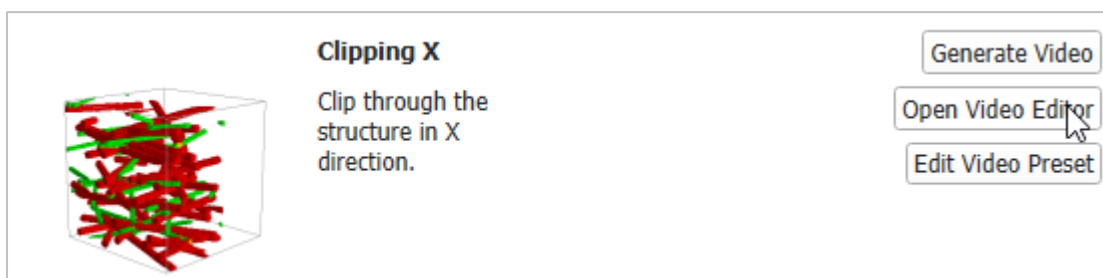
1.2.4 Examples

Based on two examples, we show here how to change the video editor settings as desired after loading a structure in 3D.

Load a structure by clicking the  icon in the toolbar or selecting **File → Open Structure (*gdt, *gad)...** in the menu bar.



Open the **Create Video** dialog ( or **File** → **Save Video As...**) and choose **Open Video Editor** next to the Clipping X video preset.

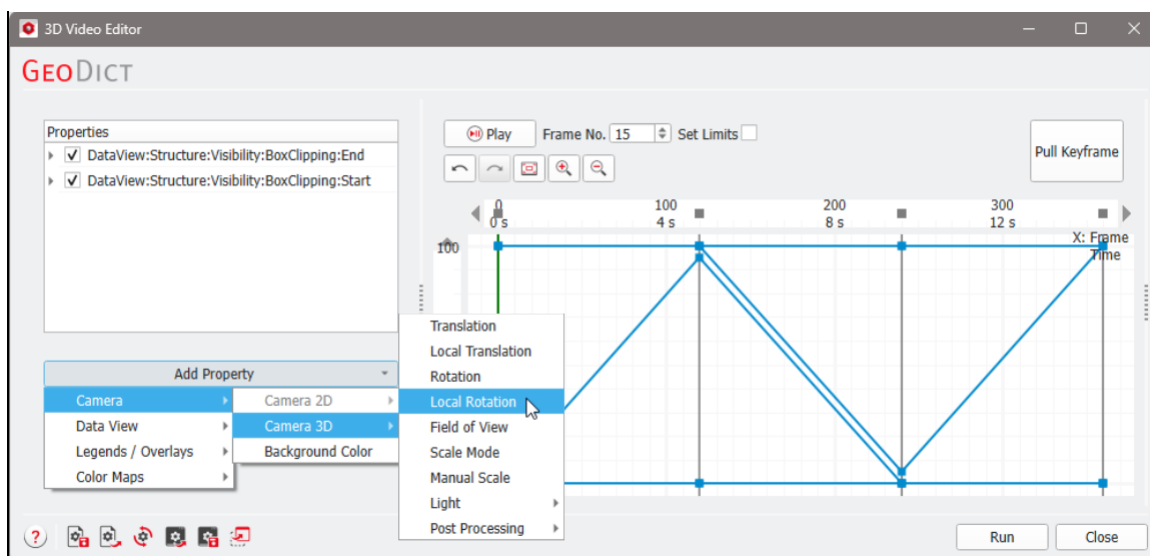


In both examples, in addition to the clipping animation, a camera movement around the Z-axis will be added. In the first example, the new property is added via the **Add Property** option and in the second example the corresponding keyframe is pulled from GeoDict (**Pull Keyframe**).

✓ How to add a property

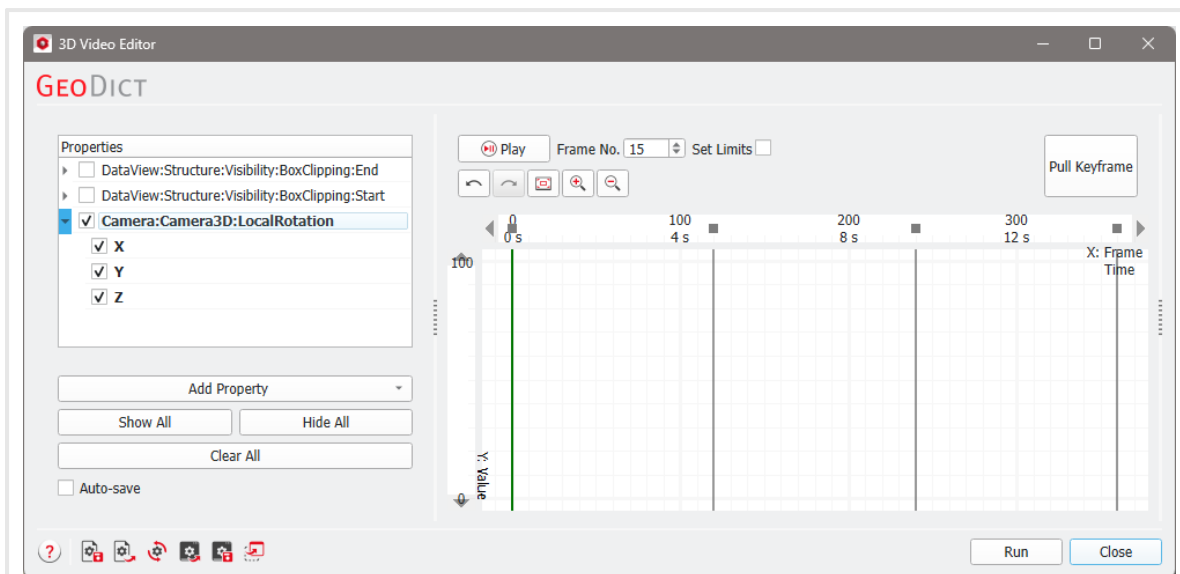
Click **Add Property** in the **Properties** field to add a new property to be changed over time in the **Video Editor** dialog.

Select **Camera** → **Camera 3D** → **Local Rotation**.

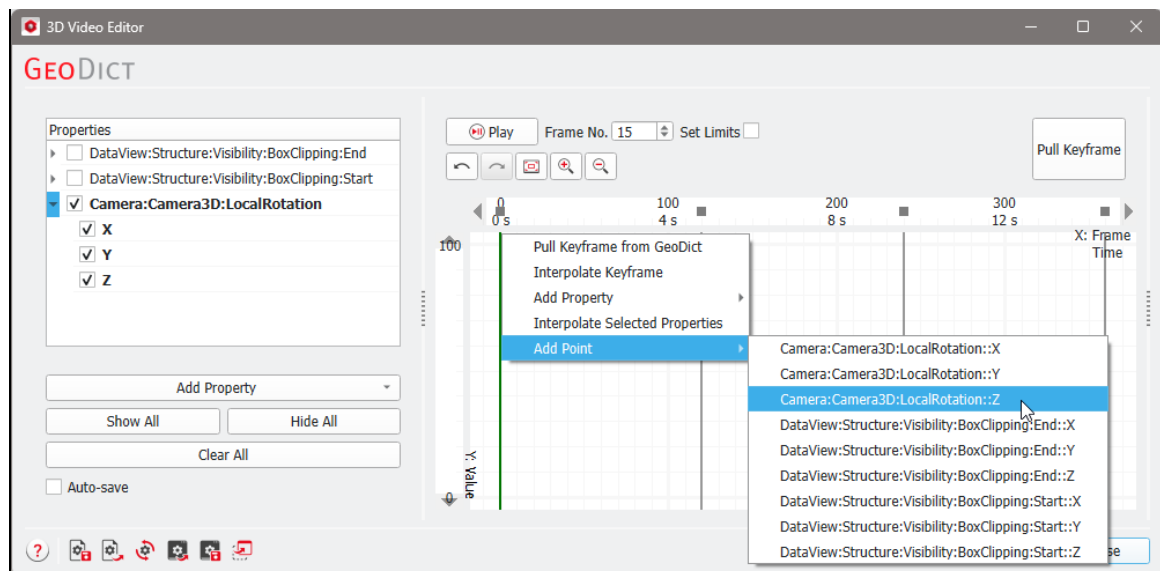


Expand the sub-properties of **Local Rotation** by clicking the arrow on the left or by double clicking on the property name.

Hide all other properties (uncheck **BoxClipping:Start** and **BoxClipping:End**) to only see the plot for **Local Rotation** in the **Graph** field. Right now, this results in an empty plot in the **Graph** field, because there are no keyframes set yet for **Local Rotation**.

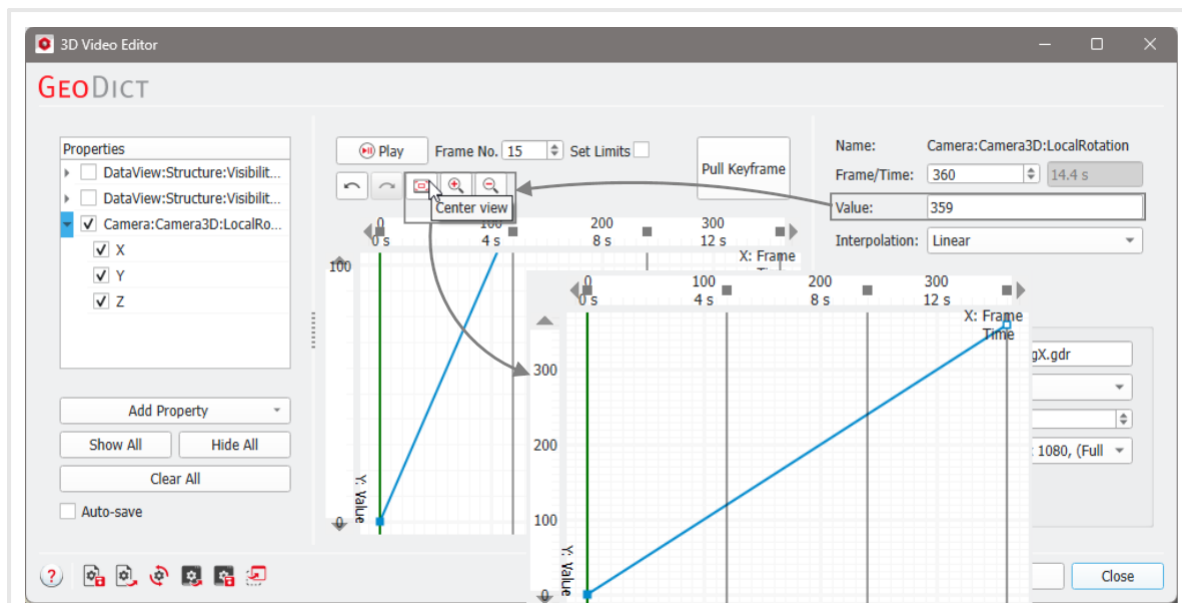


On the first keyframe, at **X-frame 0**, add a new data point for **Local Rotation:Z**, by right-clicking in the plot of the **Graph** field at frame 0. A marker appears.



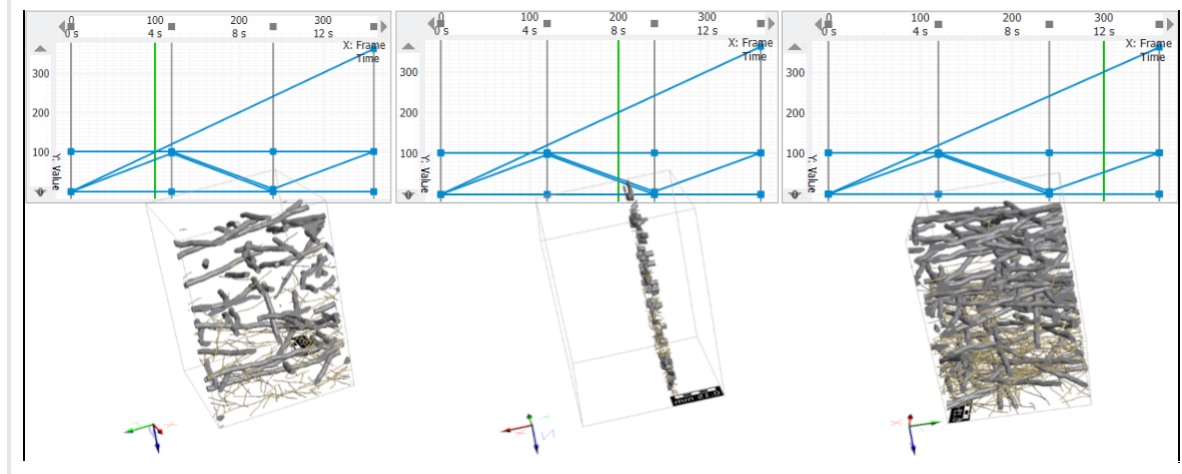
Also do this for the last keyframe, at **X-frame 360**. A red marker also appears there.

Click on the marker at frame 360 to select the data point **Local Rotation Z**. In the **Value** field, change its **Value** to **359**. In this way, a perfect loop will be created. The data point will now be out of view. Click the **Center view** icon to see the complete graph again.



Click on different frames in the plot of the **Graph** field (Frames 100, 200, and 300) and observe different takes of the structure's rotation around its Z-axis while being clipped in the Visualization area of the GeoDict GUI. To also follow the graph of the clipping animation, in the **Properties** field check to show the two BoxClipping properties again.

Click **Play** to see the structure in movement in the Visualization area of the GeoDict GUI, while the green line of the playhead moves by itself from left to right in the plot of the **Graph** field.

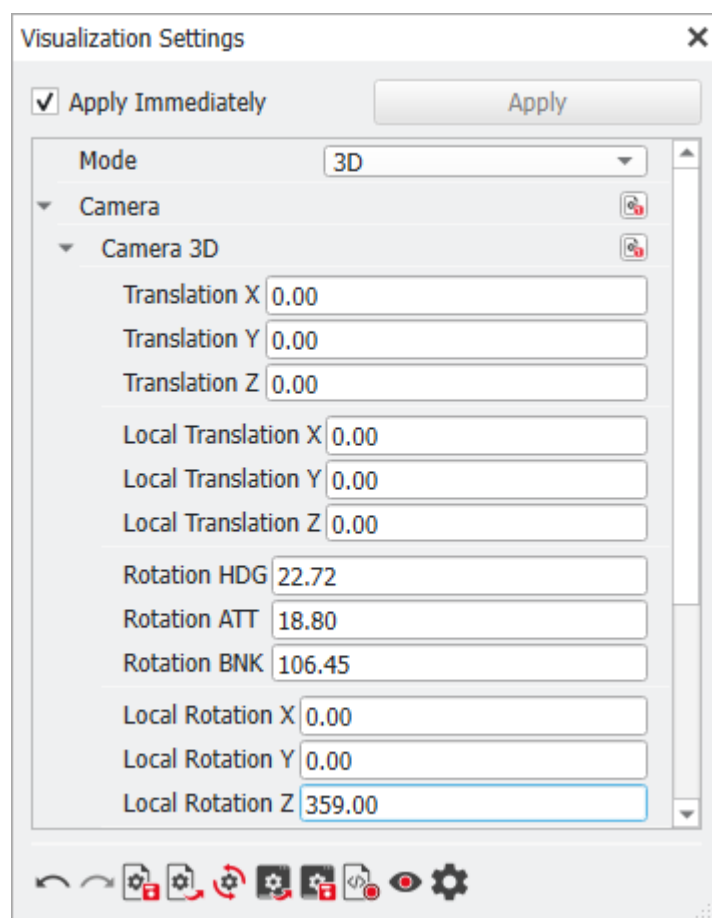


✓ How to pull a keyframe from GeoDict

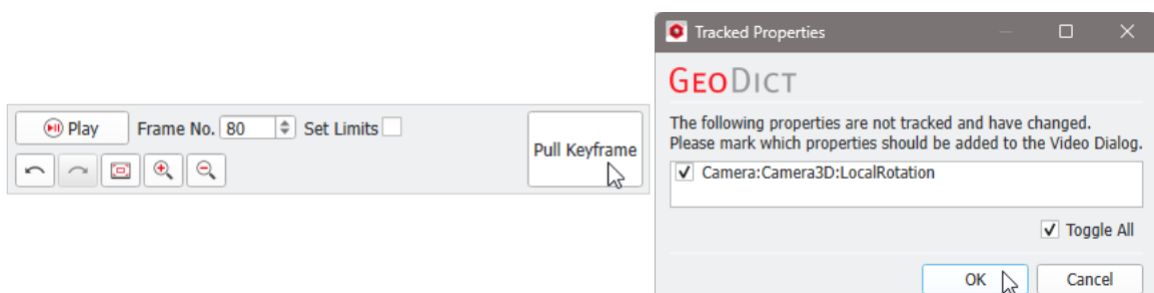
Any properties that are changed in the Visualization area of the GeoDict GUI while the **Video Editor** dialog is open, may be pulled into the plot of the **Graph** field and be part of the final video.

In the GeoDict GUI, click the **Visualization** tab in the sidebar to the right of the Visualization area to unfold the **Visualization Settings**.

Unfold the settings for **Camera** and then, **Camera 3D**. For **Local Rotation Z**, enter **359**.



In the **3D Video Editor** dialog, click **Pull Keyframe**. In the opening dialog, select **Local Rotation** and click **OK**.

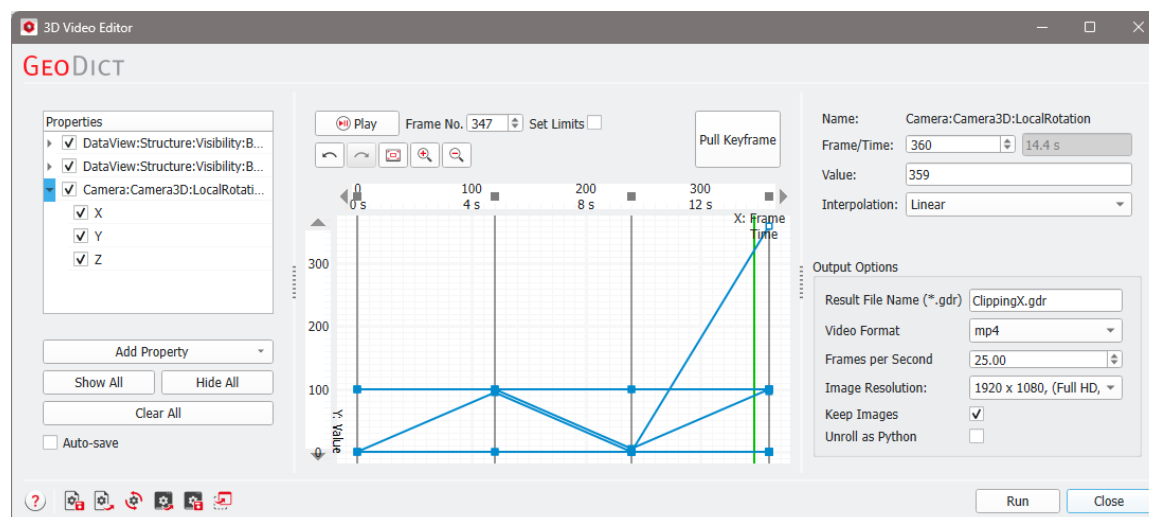


The new property appears in the **Properties** field and in the plot of the **Graph** field.

If the playhead (green line) in the plot of the **Graph** field is not placed upon an existing keyframe, a **new keyframe** is added at the playhead's position. The plot for the **new property** is added in the keyframe field between the last keyframe before and the playhead's position.

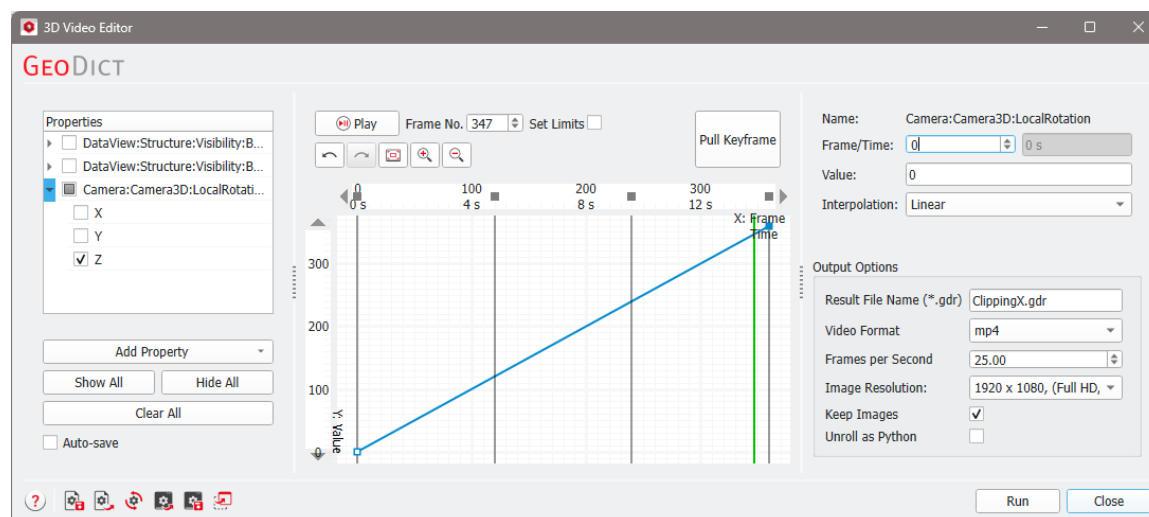
Here, the playhead was located at frame 360, which was the last keyframe from the clipping animation. No new keyframe had to be added and the keyframe before (frame 240) was used as a start keyframe for the new animation.

To highlight the **Local Rotation** property in red, select it in the **Properties** field. To apply the animation to the complete movie, the frames of the two **data points** of the **Local Rotation** property need to be changed.



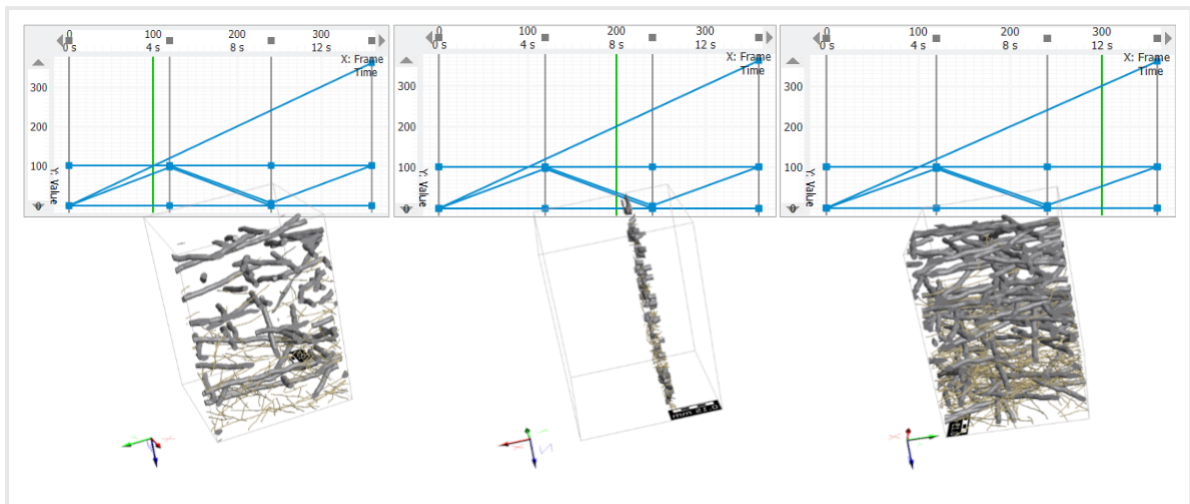
First, in the **Properties** field, hide all other properties to only see the plot for **Local Rotation** in the plot of the **Graph** field. Uncheck **BoxClipping:Start** and **BoxClipping:End**. Unfold the sub-properties for **Local Rotation** by clicking the triangle on the left, and also hide the sub-properties **X** and **Y**.

Expand the **Value** field. In the plot of the **Graph** field, select the first data point (with value 0) by clicking on it and enter **0** for **Frame** in the **Value** field. In the same way, change the **Frame** of the second data point (with value 359) to **360**.



Observe the structure's rotation around its Z-axis in the Visualization area of the GeoDict GUI while clicking on different frames in the plot of the Graph field.

Preview the animation in the Visualization area of the GeoDict GUI by clicking **Play** in the upper part of the Graph field. Here, all properties were activated in the Graph field.

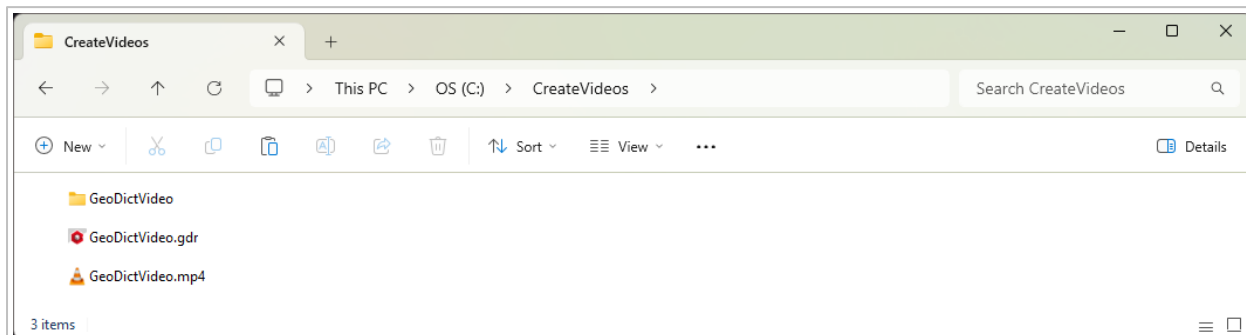


Know how! After defining the desired animation in the Video Editor, you can save it as a GeoDict Project Settings file (*.gps) by clicking the according icon  in the bottom left corner. This file can be reloaded to the video editor at any time to apply the animation to another structure. For an often used animation it is also very convenient to add it as a GeoApp to the presets in the [Create Video Dialog](#) . To start the video generation, click Run in the bottom right of the Video Editor.

Find the video resulting from the two examples below. For the video generation, the background was set to black in the Color & Visibility settings.

1.3 Results

At the end of the video generation, the following files and folder are automatically saved in the selected project folder:



- A result file. For example GeoDictVideo.gdr, which is the default name.
- A result folder with the same name as the result file (e.g., GeoDictVideo). It contains the structure file (Structure.gdt) and, if [Keep Images](#) was checked in the Export Video dialog, the folder images with all video frames as *.png files.
- A video with the same name as the result file and in the selected video format (e.g., GeoDictVideo.mp4).

For detailed information about the Result Viewer options, see the Result Viewer chapter.

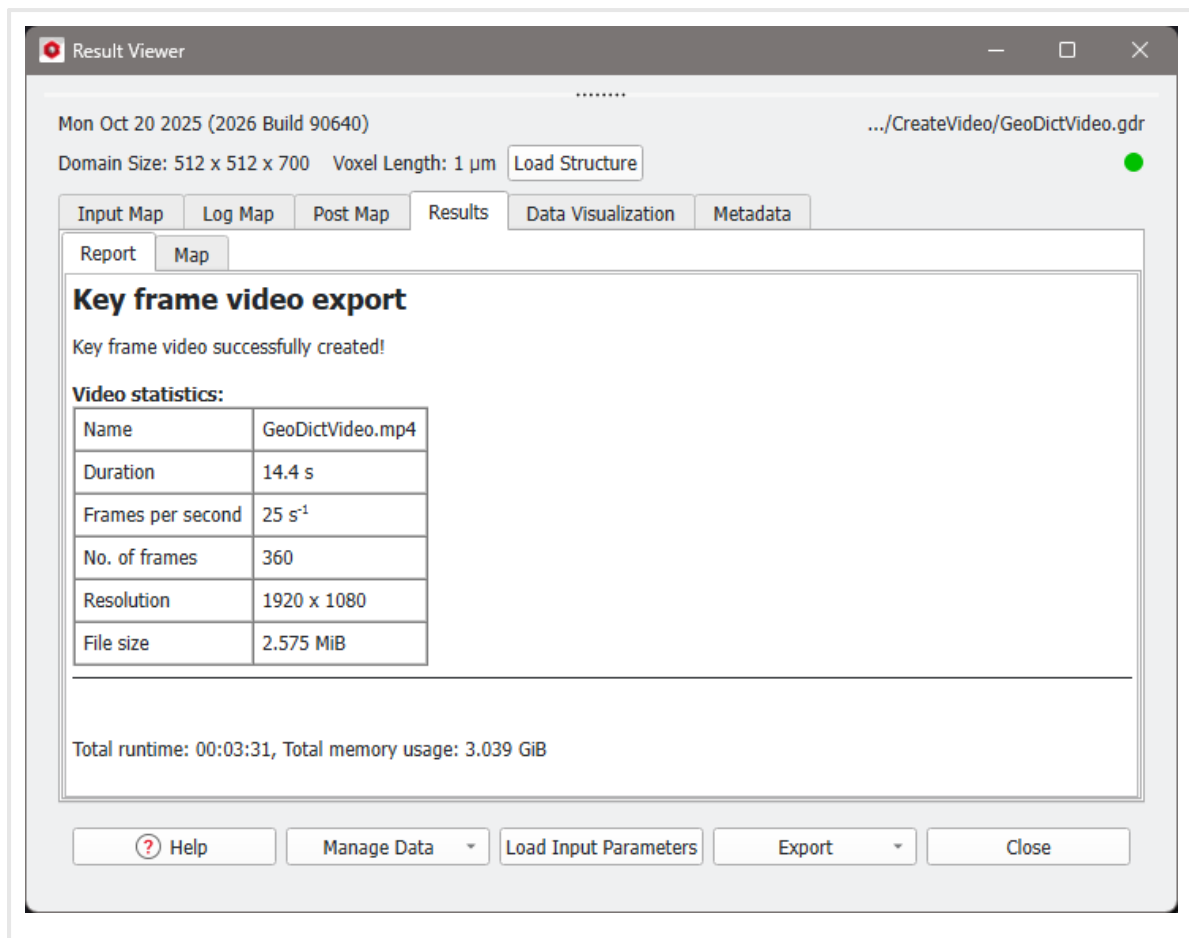
After the video is finished, the result file (*.gdr) is saved in the project folder and the Result Viewer automatically opens.



Know how! The animation settings used for the video can be loaded in the [Video Editor](#) by clicking **Load Input Map** in the Result Viewer and opening the **Video Editor** with **Open Current**, or by dragging the result file to the opened **Video Editor** and dropping it there.

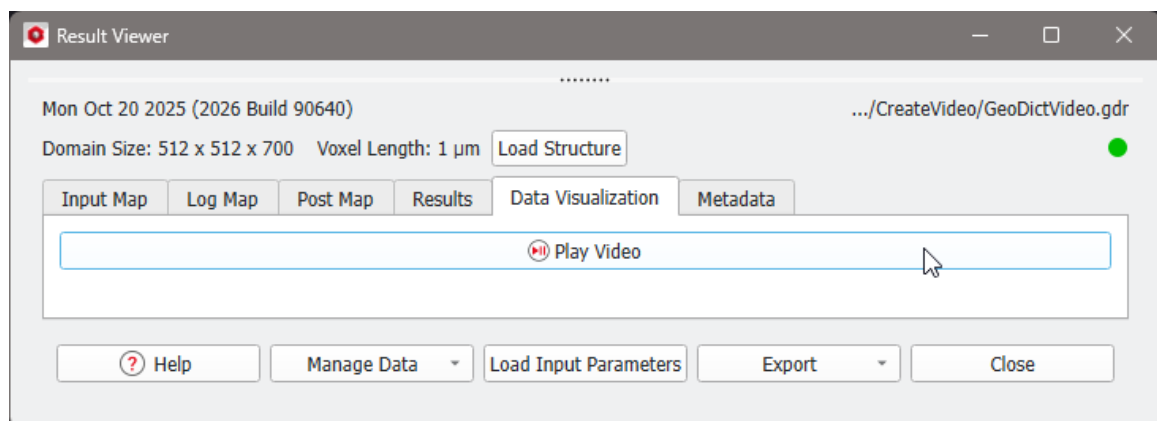
✓ Report

The **Results - Report** subtab shows the information about the generated video: the name of the video, the video duration, the FPS, the total number of frames, the resolution, and the video file size.

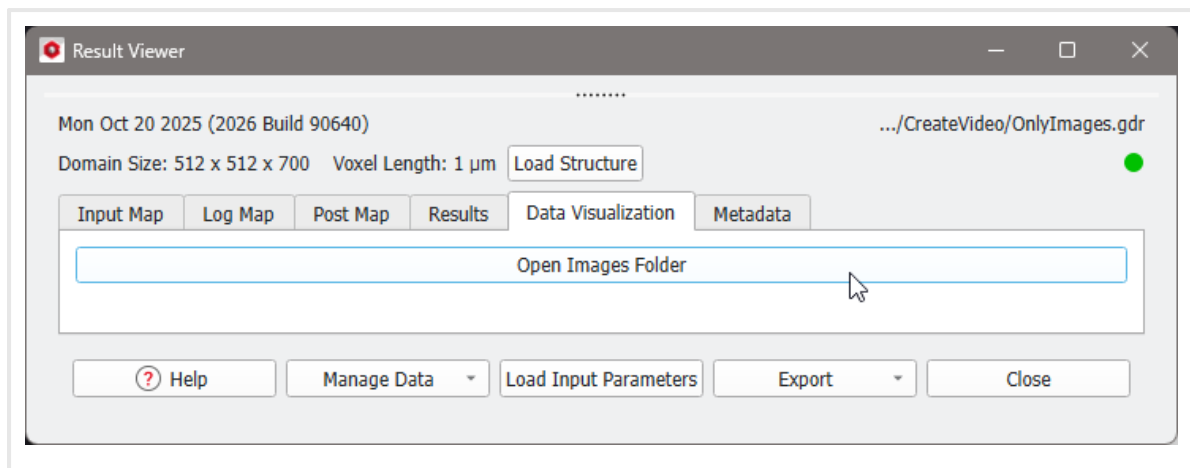


✓ Data Visualization

Under the **Data Visualization** tab click **Play Video** and the video is played in the default video player.



If [Images](#) was selected for **Video Format** in the **Export Video** dialog, clicking **Open Images Folder** opens the result folder containing the saved images, as no video is generated.



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Math2Market GmbH

Richard-Wagner-Str. 1, 67655 Kaiserslautern / Germany
www.math2market.com