

Preview

Overview

The parameters in this rollout control the representation of the fluid's caches in the viewport, showing a preview of what the fluid is doing. These preview controls can give you a sense of what is going on with your simulation, and whether it needs tweaking, before you decide to start rendering.

The **Viewport Preview** is almost completely independent from rendering, and allows you to control the visibility of specific **Grid Channels** and **Particle Types**, in order to customize the preview. Depending on the **Read Cache for Preview** mode used, all enabled parameters in this rollout will be displayed in the viewport, provided that the cache file's content is within a parameter's specified value range for that frame.

The viewport would typically display fire/smoke simulations as a **Voxel Preview**, which uses 2D triangles to emulate the shape of the volume. You can choose to preview specific Grid Channels, for example, only the Temperature or Smoke.

When simulating liquid, you could preview channels such as Viscosity and RGB, or even preview the Liquid Channel as voxels if you plan to render the liquid particles using a volumetric render mode, for example. You can also preview the simulation's Velocity, to see how Phoenix forces and standard Maya fields will affect the simulation.

Meanwhile, the **Particle Preview** is used to display liquid simulations by default. You can also enable the **Show Mesh** mode, to override the Particle Preview and show the liquid as a mesh.

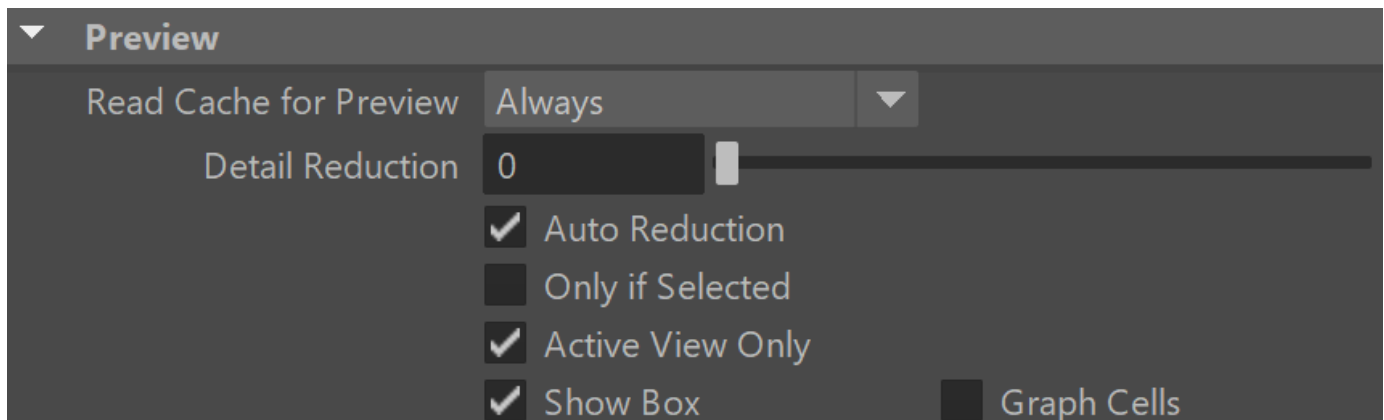
The Particle Preview section lets you control the visibility of different Particle Types, and manage their preview color. For example, you could preview only the Splash and Foam particles, or preview only the Drag particles emitted using a [Fire Source](#).

Keep in mind that the Voxel and Particle preview parameters are all independent from rendering. They do not affect the render settings or Volumetric shading.

Fire and smoke simulations can also be shaded using the real-time **GPU Shade Preview** mode, so you can quickly preview how changing the volumetric rendering options and curves affects the look of the simulation. You can learn more in the GPU Shade Preview section below on this page.

UI Path: `||Select PhoenixFDSim|| > Attribute Editor > Preview rollout`

Parameters



Read Cache for Preview | *prvReadCache* – Allows to completely disable reading of cache files in order to speed up the viewport and the simulation. When cache files are not read, neither voxels and particles, nor the grid bounding box or the **Cache File Content** under the [Simulation rollout](#) will be shown. This way scrolling the timeline would be quick as there will be no access to hard disk or the network. If you still need to see the grid bounding box and the **Cache File Content** info, you could leave this option to **Always**, and instead disable all voxel preview options, the **Mesh Preview**, **GPU Preview** and all particle previews. The intended use for this parameter is as a last step performance optimization - once you're done tweaking your setup and you're ready to commit to a high-resolution, overnight simulation, disable the preview of cache files.

Always – Cache files are always read by the preview.

Disable During Sim – Cache files are read only when the simulation is stopped. This would speed up the simulation and is good for overnight simulations where you don't need to watch the simulation constantly.

Don't Preview Caches – Cache files are never read for the preview. They will only be read during rendering, or in case any of the Phoenix tools requires them - e.g. the [Particle Shader](#), the [Grid Texture](#), etc.

Detail Reduction | *detailReduction* – Decreases the grid and particle detail in the preview. A value of 0 means no reduction. Increase this value if the interface starts to lag due to the simulation being very large. Note that this parameter does not affect the Mesh preview.

Auto Reduction | *viewAutoReduction* – Enables automatic adjustment of the **Detail Reduction** parameter to improve display performance. The preview detail will be reduced up to a point where the preview will display fast without blocking the interface. Note that the detail will only decrease automatically, but will not increase. This option works only for the Voxel and Particle previews.

Only if Selected | *onlyIfSelected* – When enabled, the content in the viewports is only shown for the selected Simulators.

Active View Only | *activeViewOnly* – When enabled, only the selected viewport shows the content of the Simulator.

Show Box | *showGrid* – When enabled, displays the Simulator's box in the viewport. The Simulator box settings can be modified from the [Grid rollout](#).

Graph Cells | *showGridCells* – Shows a lattice with the cell sizes on the sides of the Simulator's box or the Slice Preview.

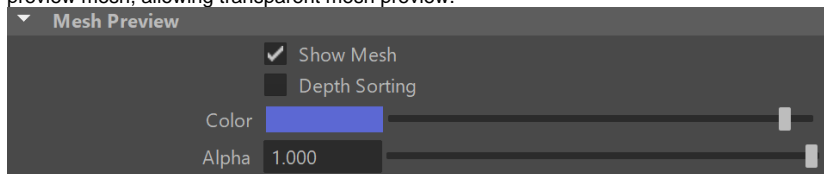
Mesh Preview

Show Mesh | *viewMesh* – Turns the mesh preview on or off. This mode overrides the Voxel Preview mode. Note that if **Render Mode** is set to **Ocean Mesh**, the ocean will have lower detail in the preview than in the render in order to speed up the viewport display.

Depth Sorting | *viewMeshAlphaSort* – When enabled, turns on precise mesh drawing when using transparency.

Color | *viewMeshColor* – Specifies the color of the preview mesh.

Alpha | *viewMeshAlphaSort* – Specifies the alpha of the preview mesh, allowing transparent mesh preview.



GPU Shade Preview

The **Phoenix GPU Shade Preview** shows a detailed Viewport Preview for fire/smoke simulations, by shading the Simulator directly inside the viewport, using the current Volumetric Options.

The preview works in real time, so you can use it to quickly preview how changing volumetric options and curves affects the look of the simulation. You can analyze their effect on the simulation's appearance and make further iterations, without having to render.

The GPU Shade Preview can also be used as an extremely basic renderer, since it can automatically save out images during simulation. This can be a useful and fast way to do a previsualization of your sequence, and review your simulation in motion.

Note that the GPU Shade Preview is not a replacement for rendering. In order to display in real time, the preview ignores Displacement, as well as any volumetric texture mapping of the Fire or Smoke. There are also some limitations as to how it displays volumes when geometries intersect the sim, or are inside the grid.

Finally, all lights are treated as directional, so using dome lights, area lights or global illumination would produce different render results than the GPU Preview. If you need to iterate on the final look of the simulation with complex lighting setups, you should use V-Ray GPU IPR, or another interactive rendering solution.

Show | *gpuViewEnbl* – Enables the GPU shading preview in the viewport. Note that geometries that intersect or exist inside the bounding box of the Simulator may appear behind the fluid or in front of it.

Required GPU memory – Shows the approximate texture RAM that will be used for the preview. Note that the GPU can allocate textures that exceed the available GPU memory but at the cost of speed. Also, there is no way to tell if the GPU can handle the texture without trying.

Add Selected Lights to GPU Preview – When a light and a Simulator are selected, the selected light will be used for the GPU preview. This button is a shortcut for adding the selected light to the **Lights** phxlight_set# which is automatically created with the Phoenix Simulator. You could do this manually by Middle-Mouse-Button drag&drop of the light into the **Lights** set in the Outliner.

Lights | *gpuViewLight* – A set that specifies the exact lights used in the preview. If empty, the Maya viewport lights will be used, which can be controlled by the viewport's **Lighting** menu. You may need to select **Use All Lights** to enable the actual lighting. Note that V-Ray lights may not be used as Maya viewport lights and you should add them to the **Lights** set explicitly. If no lights are selected neither for the Maya viewport, nor added to the Lights set, Phoenix will use one default directional light.

Max Lights | *gpuViewMaxLights* – Sets the maximum number of lights used in the GPU preview. If there are more eligible lights depending on the conditions described in the **Lights** option, only the closest lights to the Simulator will be used, and the directional lights will be always with lowest priority.

Ambient Lighting | *gpuViewAmbient* – Specifies the color of the ambient light.

Gamma | *gpuViewGammaEnbl*, *gpuViewGamma* – Specifies the gamma for the GPU preview. Affects the viewport preview only.

Save Images During Simulation | *gpuViewSaveOnSim* – When enabled, automatically saves the preview of each newly simulated frame.

Save Alpha | *gpuAlphaEnabled* – Allows saving an alpha channel if the image format is PNG or TIFF. This option is ignored for BMP and JPG. If you are using [Pdplayer](#), set the "Alpha Mode" to "Ignore Alpha" or "Premultiplied Alpha".

Save Path | *gpuViewPath* – Specifies the directory and the name template for the output preview image files. It uses the **\$(scene_dir_instance)** macro by default, and there are also other available macros as listed below. The supported formats are PNG, JPG, BMP and TIFF.

Click [Here](#) to expand additional \$(VARIABLE) information

\$(work_path) – \$(data_dir)/\$(scene)_Phoenix_frames
/\$(nodename)_####.aur
\$(data_path) – \$(data_dir)/\$(scene)_Phoenix2_frames
/\$(nodename)_####.aur
\$(scene_path) – \$(dir)/\$(scene)_Phoenix_frames
/\$(nodename)_####.aur
\$(scene_dir) – \$(dir)/\$(scene)_Phoenix2_frames
/\$(nodename)_####.aur
\$(implicit) – Same as \$(data_path).
\$(dir) – The scene directory.
\$(data_dir) – The current workspace data directory.
This can be overridden from the [Phoenix Global Preferences'](#) Default Cache Path option.
\$(scene) – The scene file name.
\$(nodename) – The name of the node.
\$(fullname) – The full name of the node.
\$(workspace) – The current workspace directory.
\$env(<variable_name>) – An environment variable.
See [Using Environment Variables](#) below.

is the frame number formatted with at least as many digits as the hash signs. If the frame digits are less than the hashes, the number is padded with zeroes to the left. As an example, the following table shows how different numbers of hash signs affect the formatting of different frame numbers.

	Result		
Frame Number	#	##	###
1	1	01	0001
10	10	10	0010
1000	1000	1000	1000

Save Frame Preview | *phxfdSaveFramePreviewSelectedSim*

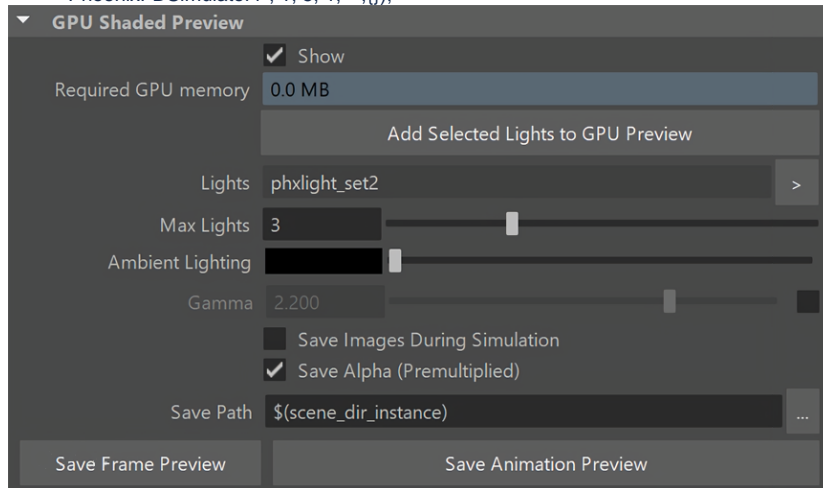
– Saves an image preview for the current frame. If you have many instances of the same Simulator, you could also merge their GPU Previews in the same image using this example MEL command:

```
phxfdSaveFramePreview(`ls -ap  
PhoenixFDSimulator1`, 1, "", {});
```

Save Animation Preview | *phxfdSaveAnimPreviewSelectedSim*

– Save an image preview for the whole simulation range. Note that the preview in the viewport will be disabled for faster processing. If you have many instances of the same Simulator, you could also merge their GPU Previews in the same image sequence using this example MEL command:

```
phxfdSaveAnimPreview(`ls -ap  
PhoenixFDSimulator1`, 1, 5, 1, "", {});
```



Particle Preview

The parameters here control the visualization of **Particle Types** generated by the Simulator. Phoenix can only preview the Particle Types present in the cache file for the current frame.

You can specify a **Particle Channel** to use as a basis for adjusting the particle preview color, using the **Scale Color By** option. For example, you could set the Scale Color By option to the Speed particle channel, so that the faster the particles move, the whiter they appear in the preview.

You can find more info on Particle Channels from the Particle Channel Ranges page.

Show | *prv_particles* – Enables the preview of particles. The controls below affect the visualization of the currently selected particle group.

Particle Size | *viewPartSize* – Sets the size of the particles in the Viewport. Note that all particles are drawn with the same size.

Particle Systems | *viewPrtSysNames* – Displays a list of particle systems generated by the Simulator. Selecting a particle system allows you to edit its preview settings.

Show Selected System | *viewPrtSysShowUI* – When enabled, the particle system will be visible in the Simulator preview. You can choose the Particle System to edit from the particle Systems menu.

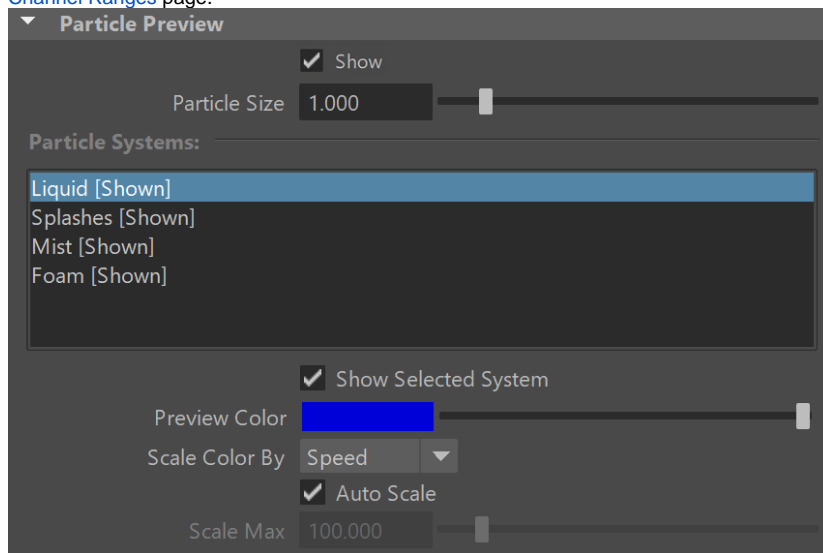
Preview Color | *viewPrtSysColorUI* – Specifies the default color of the particles. Moving particles are displayed as a blend between their default color and white, based on the selected Scale Color By channel. Note that if the particle system has an RGB channel exported, it will be used in place of the Preview Color.

Scale Color By | *viewPrtSysColScaleChanUI* – Specifies the particle channel used for adjusting the particle preview color.

- **No Scaling** – All particles will be the same color - the one specified by **Preview Color**.
- **Speed** – The **faster** the particles move, the whiter they will appear. The preview is only affected by the **Scale Max** option if the particle system has the **Velocity** channel export enabled.
- **Size** – The **larger** the particles are, the whiter they will appear. The preview is only affected by the **Scale Max** option if the particle system has the **Size** channel export enabled.
- **Age** – The **older** the particles are, the whiter they will appear. The preview is only affected by the **Scale Max** option if the particle system has the **Age** channel export enabled.
- **Viscosity** – The **higher** the viscosity the particles, the whiter they will appear. The preview is only affected by the **Scale Max** option if the particle system has the **Viscosity** channel export enabled.

Auto Scale | *viewPrtSysAutoWSpeedUI* – When enabled, automatically calculates **Scale Max** based on the Min/Max range of the selected **Scale Color By** particle channel, assuming the respective channel export has been enabled in the [Output](#) rollout for the selected particle system.

Scale Max | *viewPrtSysWSpeedUI* – When **Auto Scale** is disabled, allows you to specify a constant value at which the particle preview color becomes pure white. Particles with a **Scale Color By** channel value higher than the specified **Scale Max** are also pure white. You can also find more info about the usual particle channel maximum values on the [Particle Channel Ranges](#) page.



Voxel Preview

The **Voxel Preview** displays the **Grid Channel** content of each cell. Phoenix can only preview the channels present in the cache file for the current frame. All enabled channels are drawn if their content is between the corresponding thresholds.

To see the list of available channels and their ranges for an input sim cache, go to the Cache File Content section of the Simulation rollout. You can also find more info on the [Grid Channel Ranges](#) page.

Note that you can also specify the Voxel Preview value range for any Grid Channel, if you disable the **Auto Range** option.

For example, you could enable only **Smoke**, and specify the range to be between 0.7 and 1.0, so that you can see where the smoke is getting thicker. Grid Smoke Channel values that are below 0.7, or above 1.0, would not appear in the preview at all.

Likewise, you could enable only **Viscosity** for liquid simulations, and specify the range so that you can see where the liquid is more or less viscous.

Only the Overlap Of: | *andReduction* – When enabled, all of the enabled channels below in a cell must meet the selected threshold conditions to visualize the cell.

Temperature | *viewTemp*,
viewTempColor, *viewTempColor2*,

viewTempThreshold, *viewTempThreshold2* – Enables the representation of the temperature.

As Fire | *viewTempNatural* – When the temperature is in Kelvins, e.g. when coming from a Phoenix simulation, the voxel colors come from a physically correct black body radiation model. In this mode the custom color for the temperature are disabled. Check the [Grid Channel Ranges](#) for more info.

Smoke | *viewSmoke*, *viewSmokeColor*, *viewSmokeColor2*, *viewSmokeThreshold*, *viewSmokeThreshold2* – Enables the representation of the smoke.

Fuel | *viewFuel*, *viewFuelColor*, *viewFuelColor2*, *viewFuelThreshold*, *viewFuelThreshold2* – Enables the representation of the fuel.

Velocity | *viewVel*, *viewVelColor*, *viewVelColor2*, *viewVelThreshold*, *viewVelThreshold2* – Enables the representation of the velocity.

Velocity Streamlines | *viewVelStreamlines*, *viewVelStreamlinesThreshold*, *viewVelStreamlinesThreshold2*, *viewVelStreamlinesColor*, *viewVelStreamlinesColor2* – Traces the velocity field of the cache files to generate a streamline preview.

As Rainbow | *viewVelStreamlinesColorCurve* – Represents the Velocity Streamlines in rainbow colors, where red is the fastest, green is medium speed and blue is the slowest.

Streamlines Length | *viewVelStreamlinesMaxIterations* – Signifies the maximum length of each streamline in the preview. Adjusting the value will provide you with a guide/preview of the velocity field's motion. The Streamline's length is measured in voxels and at the lowest setting, the Streamlines will be no larger than a voxel.

The **Velocity** Preview is inactive when the **Forces** Preview is enabled, and vice versa. Similarly, the **Velocity Streamlines** Preview is inactive when the **Force Streamlines** Preview is enabled, or the other way around.

Forces | *viewForce*, *viewForceColor*, *viewForceColor2*, *viewForceThreshold*, *viewForceThreshold2* – Enables preview of how Phoenix forces and standard Maya fields will affect the simulation. This preview can be shown even without any loaded simulation.

Add Selected Forces or Fields - When a native Maya or Phoenix force and a Phoenix Simulator are selected, the selected force will be added to the Forces preview of the Simulator. This button is a shortcut for adding the selected force to the **Force List** `phxforceprv_set1` which is automatically created with the Phoenix Simulator. You could do this manually by Middle-Mouse-Button drag&drop of the force into the **Force List** set in the Outliner.

Force Streamlines | *viewForceStreamlines*, *viewForceStreamlinesThreshold*, *viewForceStreamlinesThreshold2*, *viewForceStreamlinesColor*, *viewForceStreamlinesColor2* – Enables a streamline preview of how Phoenix forces or standard Maya fields will affect the simulation. This preview can be shown even without any loaded simulation.

As Rainbow | *viewForceStreamlinesColorCurve* – Represents the Force Streamlines in rainbow colors, where red is the fastest, green is medium speed and blue is the slowest.

Lines Length | *viewForceStreamlinesMaxIterations* – Signifies the maximum length of each streamline in the preview. Adjusting the value will provide you with a guide/preview of the force field's motion. The Streamline's length is measured in voxels and at the

lowest setting, the Streamlines will be no larger than a voxel.

Unlike other voxel preview channels which use the size of the loaded cache, the Forces preview can also work without a loaded cache and will use the grid size of the Simulator.

Additionally, some Phoenix forces and standard Maya fields such as the Drag force are not supported yet, are shown as if their velocity is always 0 and will not be visible. In addition, forces that act differently depending on the quantity of content in the grid (e.g. amount of liquid, smoke, or no content) are not yet supported by the preview.

RGB | *viewUVW*, *viewUVWThreshold*, *viewUVWThreshold2* – Enables the representation of the RGB channel or the Wavelet channel, depending on which one is being used.

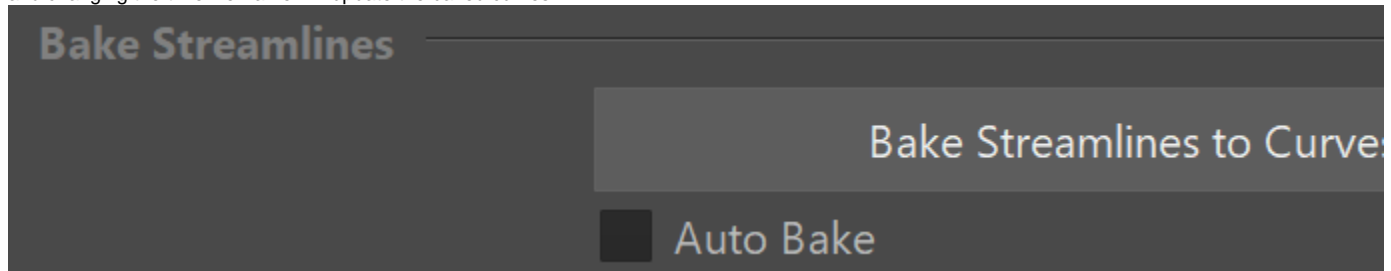
Auto Range | *viewAutoRange* – When enabled, automatically adjusts the preview ranges of visible channels for the current frame so that important data is always visible and the preview is always quick.



Bake Streamlines

Bake Streamlines to Curves – Button for converting the currently shown Streamline preview (either Velocity Streamlines or Force Streamlines) into native Maya curves. The baked curves can be rendered like any regular Maya curve by using the [V-Ray Renderable Curves](#) node.

Auto Bake | *autoBakeStreamlineCurvesOnPreviewChange* – Enables automatic Streamlines to Curves baking on any change in the Streamlines Preview. While the **Auto Bake** option is enabled you don't have to press the Bake Streamlines button in order for scene changes to be applied to the curves and changing the timeline frame will update the baked curves.



Slice Preview

The Slice preview displays only a single slice of voxels which can be convenient for debugging and fine-tuning a simulation.

Draw a Slice | *viewSliceAxis* – When enabled, only a voxel-thick cross-section of the grid is visible. This works for voxels, particles, and velocity streamlines, but not for the GPU Preview or the Mesh Preview. It allows for a better view of occluded details and can help when previewing very rich data such as velocity fields, or in order to see underwater cavities.

Along Axis X, Y, Z – Slices the grid along the specified axis.

Disabled – Turns the Draw Just a Slice feature off.

Slice Level | *viewSliceLevel* – Specifies the offset of the slice from the bottom center of the grid in voxels.

Slice Width | *viewSliceWidth* – Specifies the width of the slice in voxels.

