

WINGS VIOSO Dome Shaders (EN)

What are the Dome Shaders needed for ?

Image content for dome projections are usually produced in a square-shaped Domemaster format and used as such in the WINGS show timeline. The images contain a geometric distortion following the sphere and will regain their correct eye perspective by projection onto the curved dome surface.

Because all information about the surface is stored within the VIOSO calibration, even 2D-based media players such as WINGS are capable of playing back flat Domemaster files without problems. But if 2D images are to be used as picture inserts („picture-in-picture“) which are not produced in Domemaster format, the files cannot be used in a WINGS show without further processing.

This is why VIOSO has developed so-called dome shaders. These shaders can be applied to image objects as WINGS realtime effects and will distort the footage for a correct representation on the spherical surface. The shader effects can be applied to all image objects such as still images, video clips or even live inputs.

Installation of files

The shaders are delivered as files with .fx-suffix:

ColDome_2DtoGrid.fx

ColDome_2DtoShape.fx

ColDome_Pano2Sphere.fx

For installation, please close the WINGS application and copy these files into the following directory

C:\Program Files(x86)\AV Stumpf1\Wings 5\Effects

in addition to the .fxz files that can be found there. After restarting WINGS, the dome shader effects are available in the realtime effects section.

Available effects

After installation, the following dome shaders are available in the „Basic Effects“ section in WINGS:

Dome 2DtoGrid

Places a 2D object as picture-in-picture on the sphere. Image edges are always aligned to the longitude/latitude lines („grid“). This effect works best in the lower end, close to the horizon, and is suitable for placement of multiple objects next to each other.

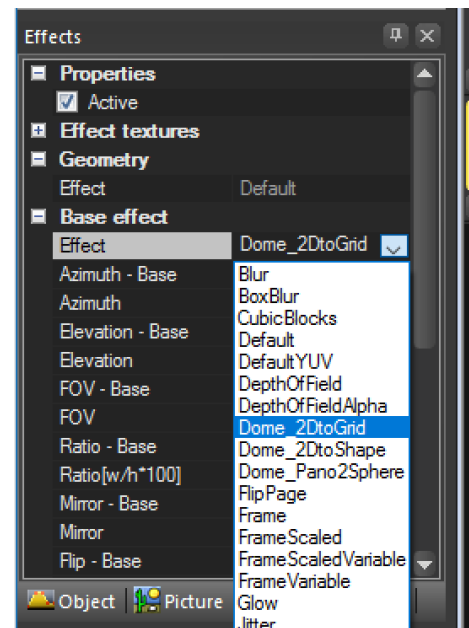
Dome 2DtoShape

Tries to emulate a plane in the 3D space by spherical distortion. However, this is not a real 3D scene. Works best close to the top of the sphere, or seen from the sphere center.

Dome Pano2Sphere

Wraps a 2D image onto the sphere surface. This effect can be used for e.g, using equirectanguöar panorama images or 360 degree videos.

All effects offer some variable parameters to adjust image orientation or sizing. These parameters can be used dynamically by using WINGS variables or realtime data from AVIO.



Please note that the „ratio“ parameter must always be set correctly to the original aspect ratio (see following examples).

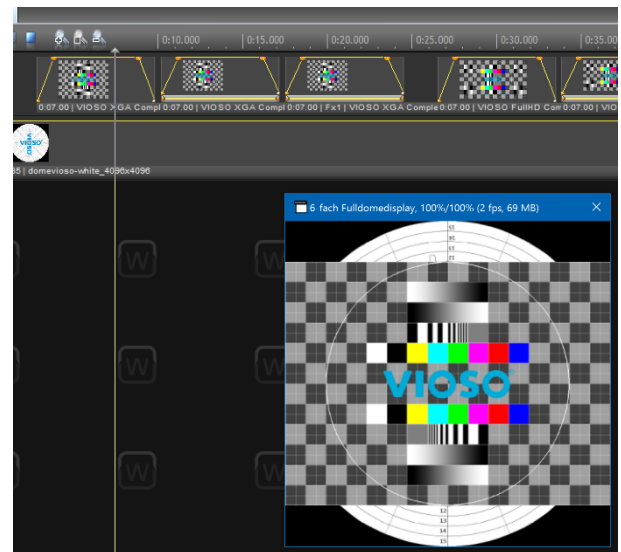
Examples

Below you find an example on how to use the dome shaders:

1. Insert image footage into track

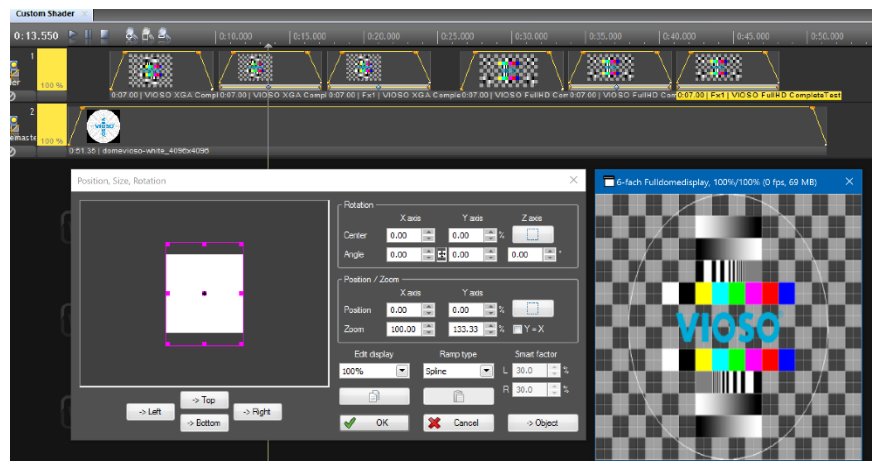
First insert your footage object into a picture or video track within the WINGS domescreen project. It is a good idea to note or calculate the original footage aspect ratio (width / height).

The image will now be displayed full screen, but keeping the original aspect ratio (in the background shown here is a circular dome master test image)



2. Adjust aspect ratio

To make the shaders work correctly, the footage has to get the aspect ratio of the dome master format (1:1 square) first. It is easiest to use a position/rotation track for this purpose.



Create a new keyframe by double clicking on the yellow keyframe track of the object, and scale the object asymmetrically. In most cases you will need to stretch the object vertically. Uncheck the "Y=X" option and set the Y value to 100 times of the aspect ratio (here 133,33):

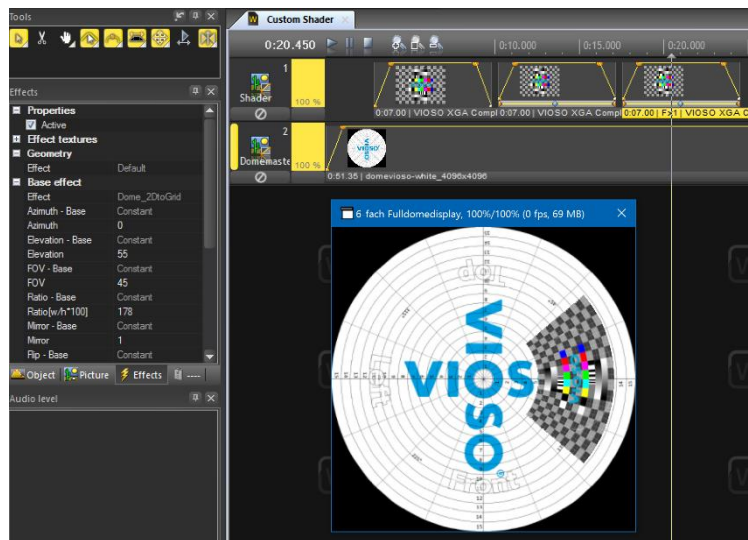
Image format 4:3 = Aspect Ratio 1,3333 : 1 => Zoom X = 100 / Zoom Y = 133,33

To avoid that the scaling values change over time, apply the values to the whole length of the footage by clicking on “Object”, which will also close the window.

3. Apply a dome shader as effect

Select the image object and activate “Realtime effects” in the properties windows. Select the appropriate effect from the “Basic” pulldown menu (Dome2DtoGrid shown here).

The effect will affect the image immediately using default values. In this case, the overlayed image is rendered as a sphere segment.



4. Adjust effect parameter values

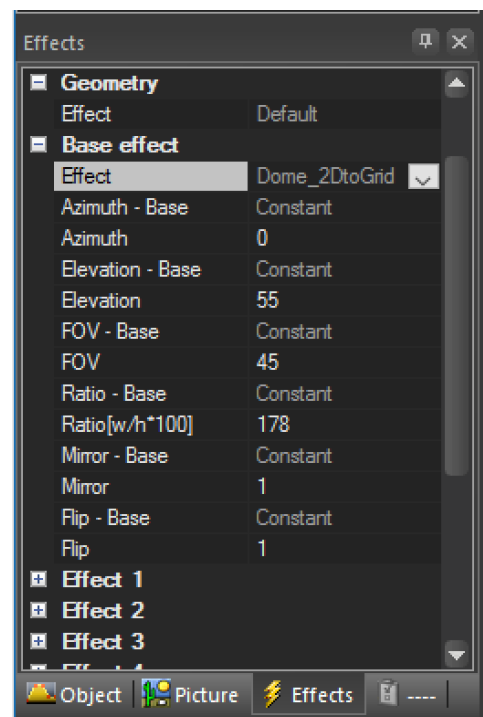
The position (azimuth and elevation) and viewing angle of the image object can be set using the effect parameters.

IMPORTANT:

Please always set the aspect ratio parameter in the shader settings to the value of the original aspect ratio of the image to inform the shader calculation of the ORIGINAL ratio. Since WINGS effects can only handle integer values, multiply your aspect ratio by 100, so for example:

16:9	1,77:1	insert value 177
3:2	150:100	insert value 150
4:1	400:100	insert value 400

If needed, parameters “Mirror” and “Flip” may be used for mirroring the image on its horizontal and vertical axis.



5. Change / animate object properties

Please note that animating an object on the dome sphere using standard WINGS position keyframing is not possible due to different coordinate systems and can lead to strange effects and distortions. Please use the effects parameters and variables with data objects instead.

One exception is the horizontal orientation (Azimuth) of the object, which can also be changed by rotating the object around its Z-axis.

6. Deactivate texture tiling

In some cases it may happen that the image is split up in multiple tiles after applying a dome shader effect.



In this case, please select “Always load image completely” in the image object properties.

