

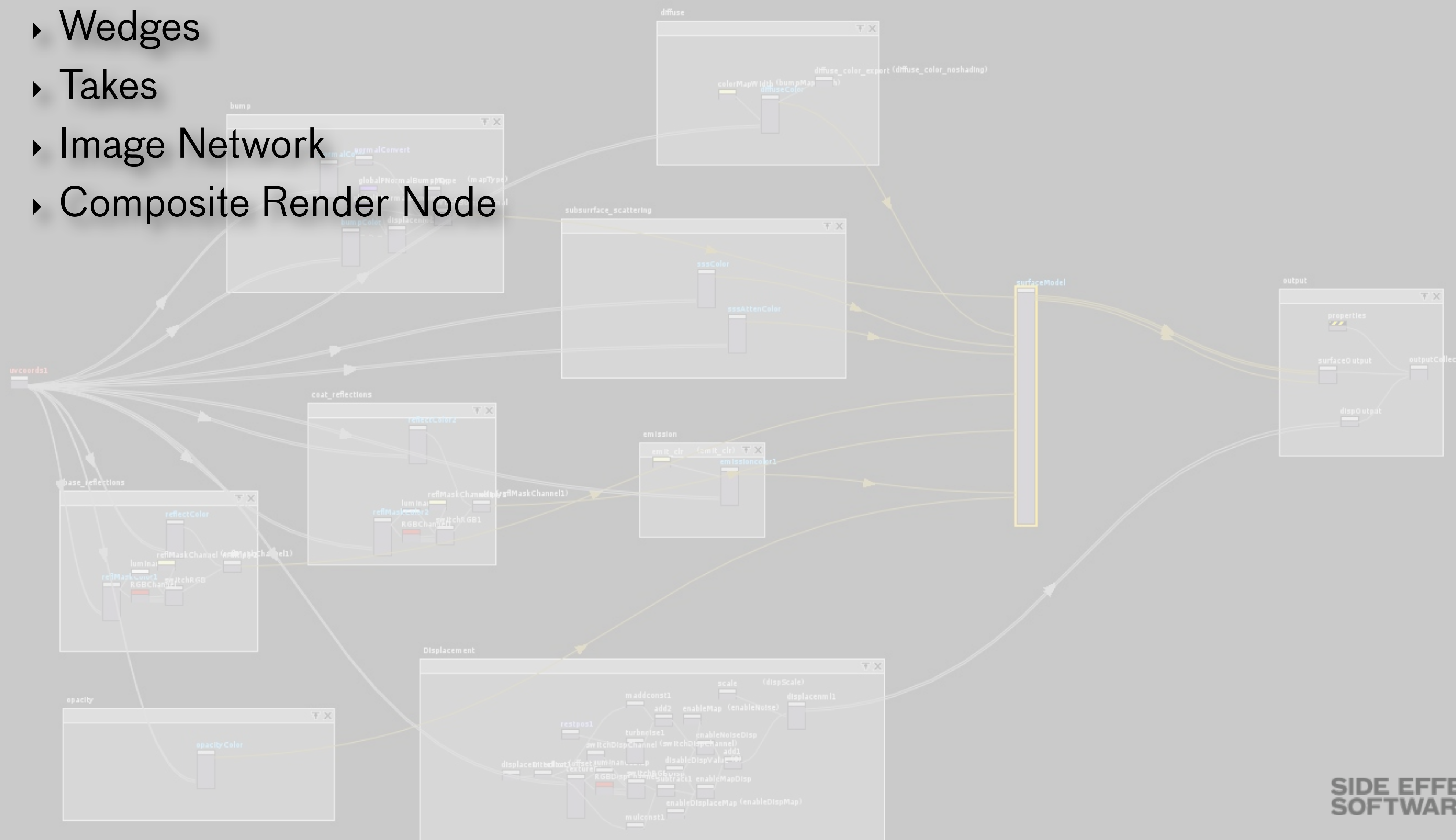
Houdini

Light, Shade, Render

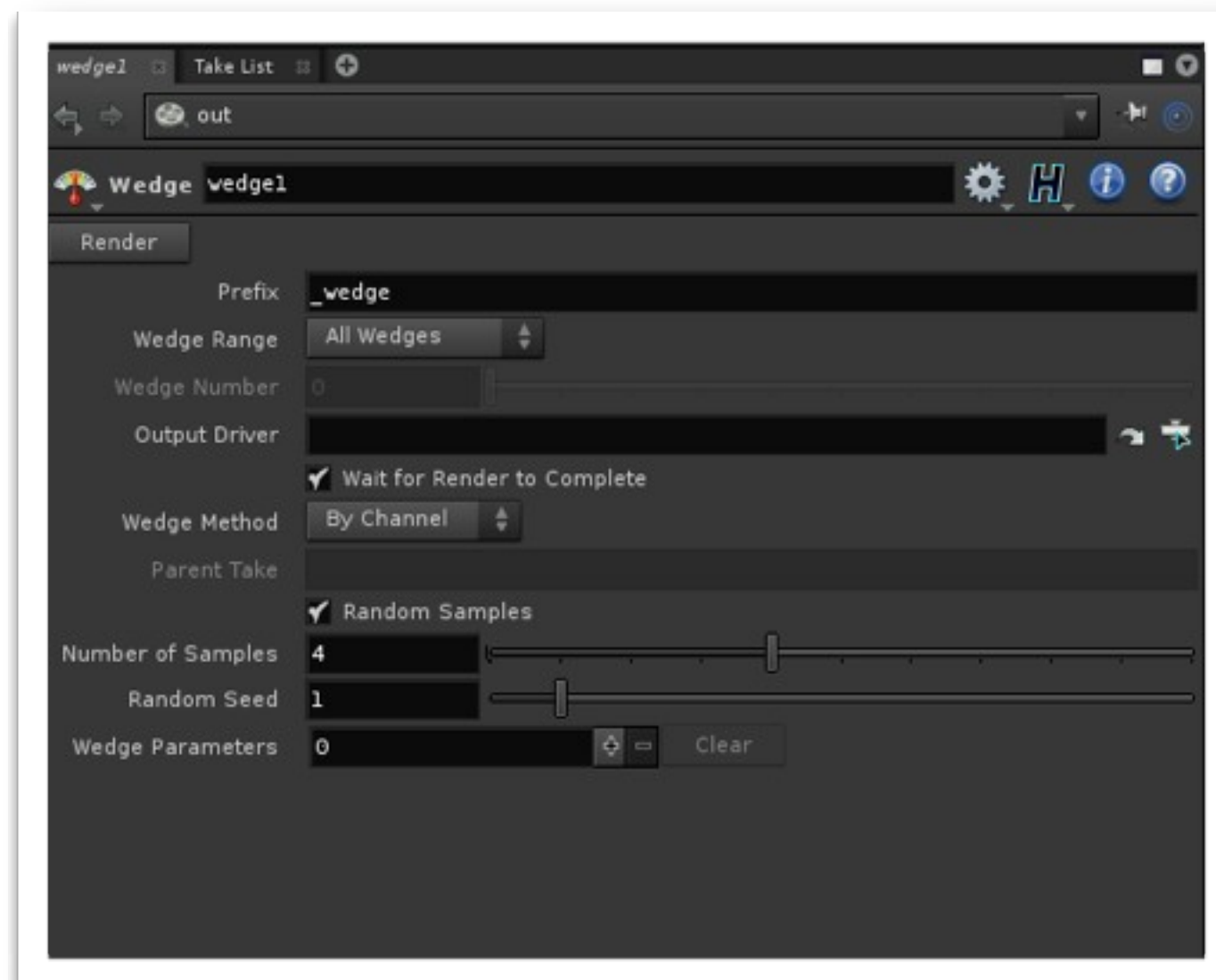
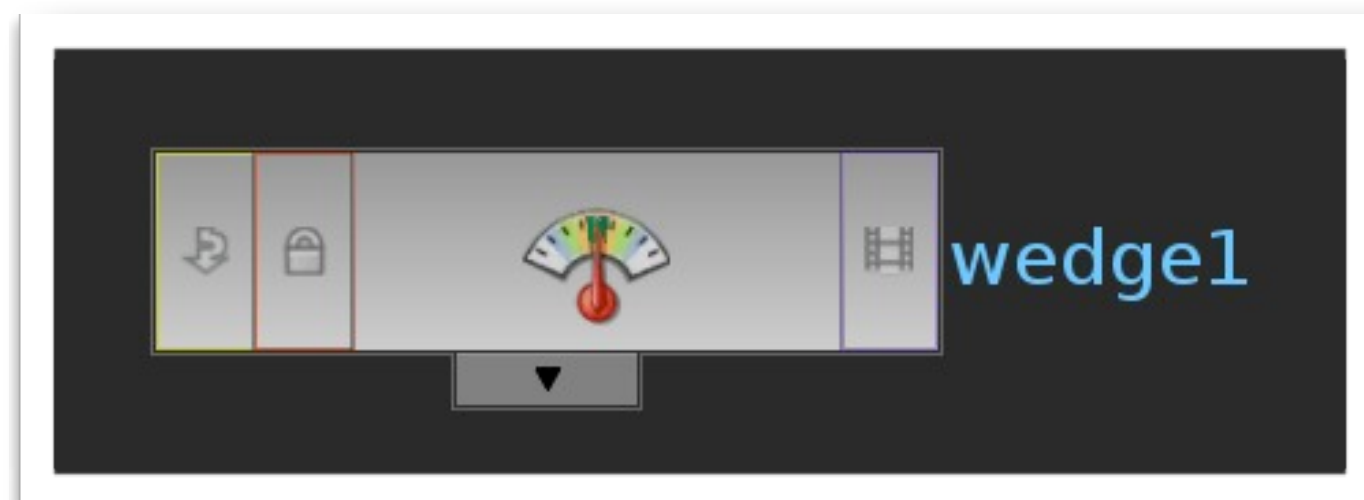
M09:Creating an Efficient Pipeline

Agenda

- ▶ Wedges
- ▶ Takes
- ▶ Image Network
- ▶ Composite Render Node



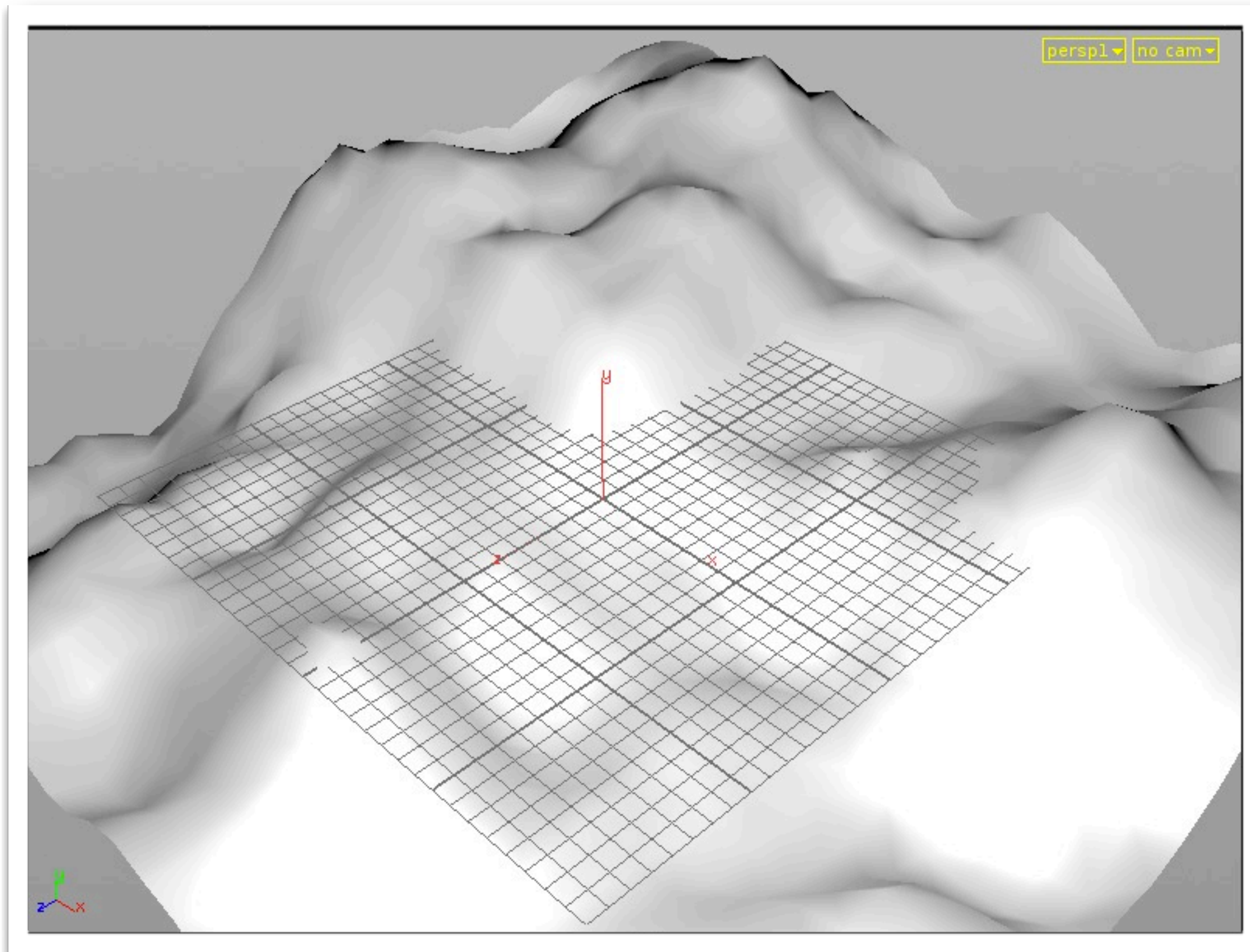
Wedge



- ▶ Re-renders the same ROP multiple times with different settings
- ▶ The Wedge ROP will render the specified ROP multiple times. Each time it will vary some parameters in the .hip file. This is useful for exploring how changing parameters will change the look for expensive functions.
- ▶ The WEDGE variable will be set to a string that describes the current set of parameters. Using this in filenames output can ensure each wedge doesn't conflict with the other wedges. Alternatively, if one is wedging to MPlay, the individual wedges will render together. The output file could be set to filename_\$WEDGE_\$F.pic to ensure each wedge gets its own image sequence.

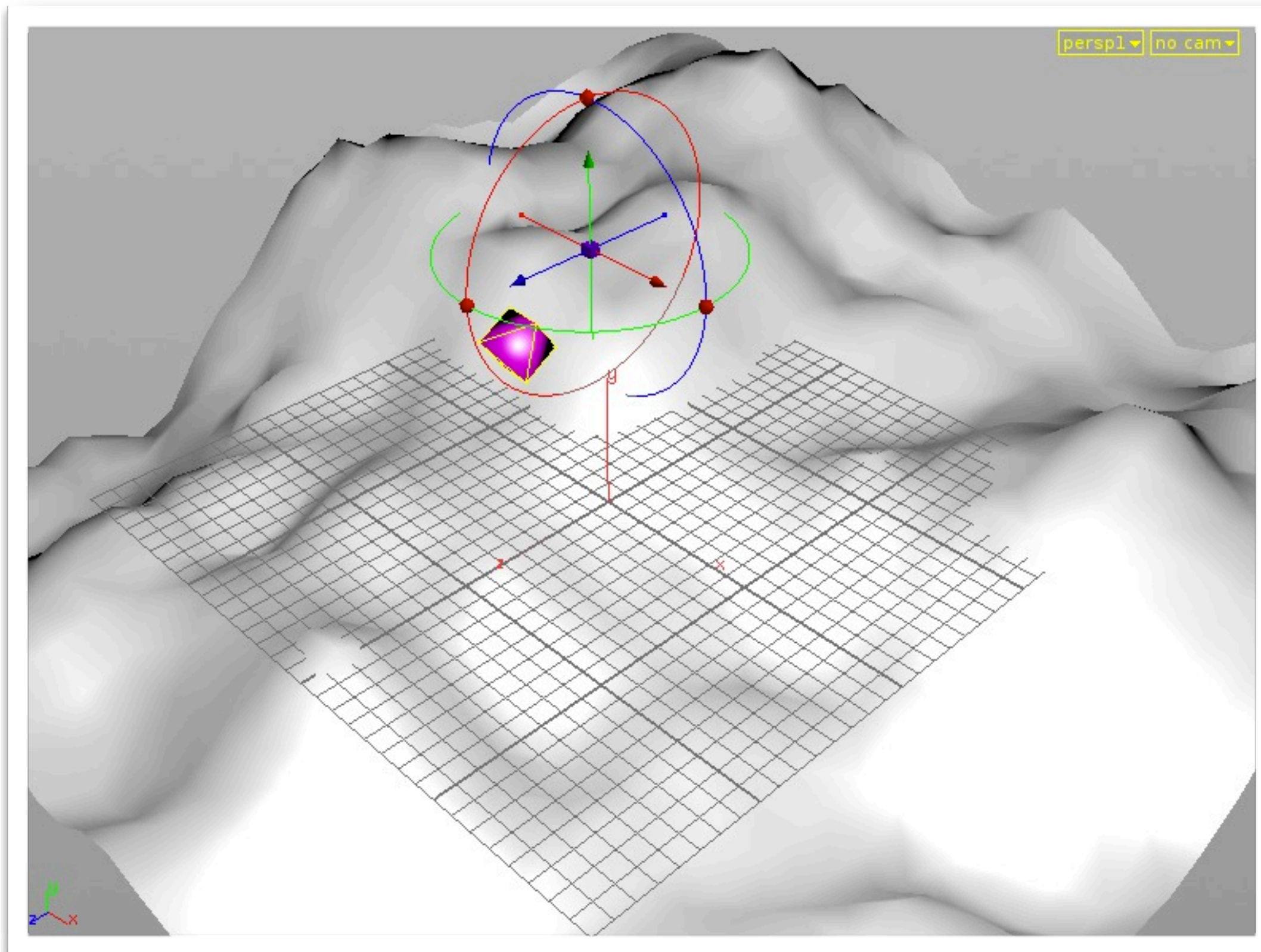
- ▶ Wedge can be used with
 - ▶ GEOMETRY ROP
 - ▶ MANTRA ROP

Wedge Geometry



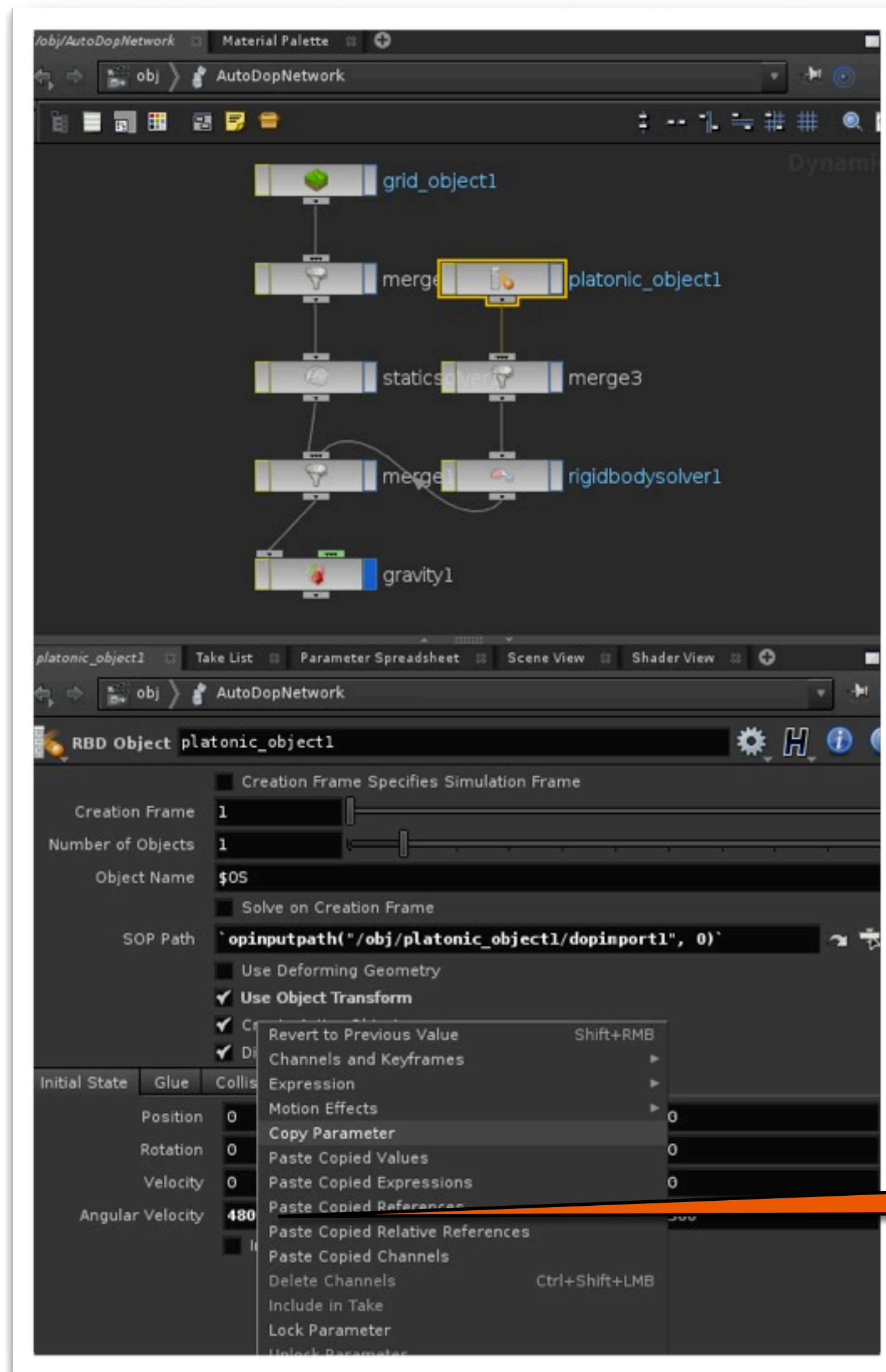
- ▶ Let's make a simple RBD
 - ▶ Drop down a grid
 - ▶ make it 50x50 in size and divisions
 - ▶ Append a Mountain SOP and make it look like a terrain
 - ▶ In the shelf tools click on the Rigid Bodies Tab
 - ▶ Select Terrain Object, then click on the terrain and hit Enter/Return

Wedge Geometry (cont.)



- ▶ Drop down a Platonic
 - ▶ Make it a Teapot or Octahedron
- ▶ Raise it off the Ground and angle it
- ▶ Go inside the Platonic and add a Color SOP
 - ▶ Change the color
- ▶ In the shelf tools select RBD Object
 - ▶ Select the Platonic and hit Enter/Return

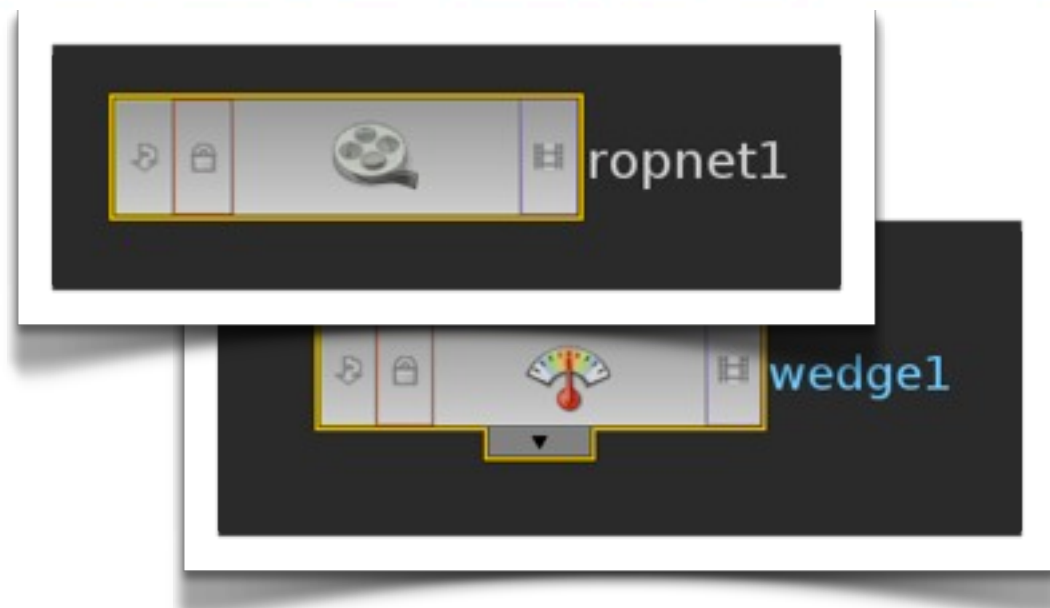
Wedge Geometry (cont.)



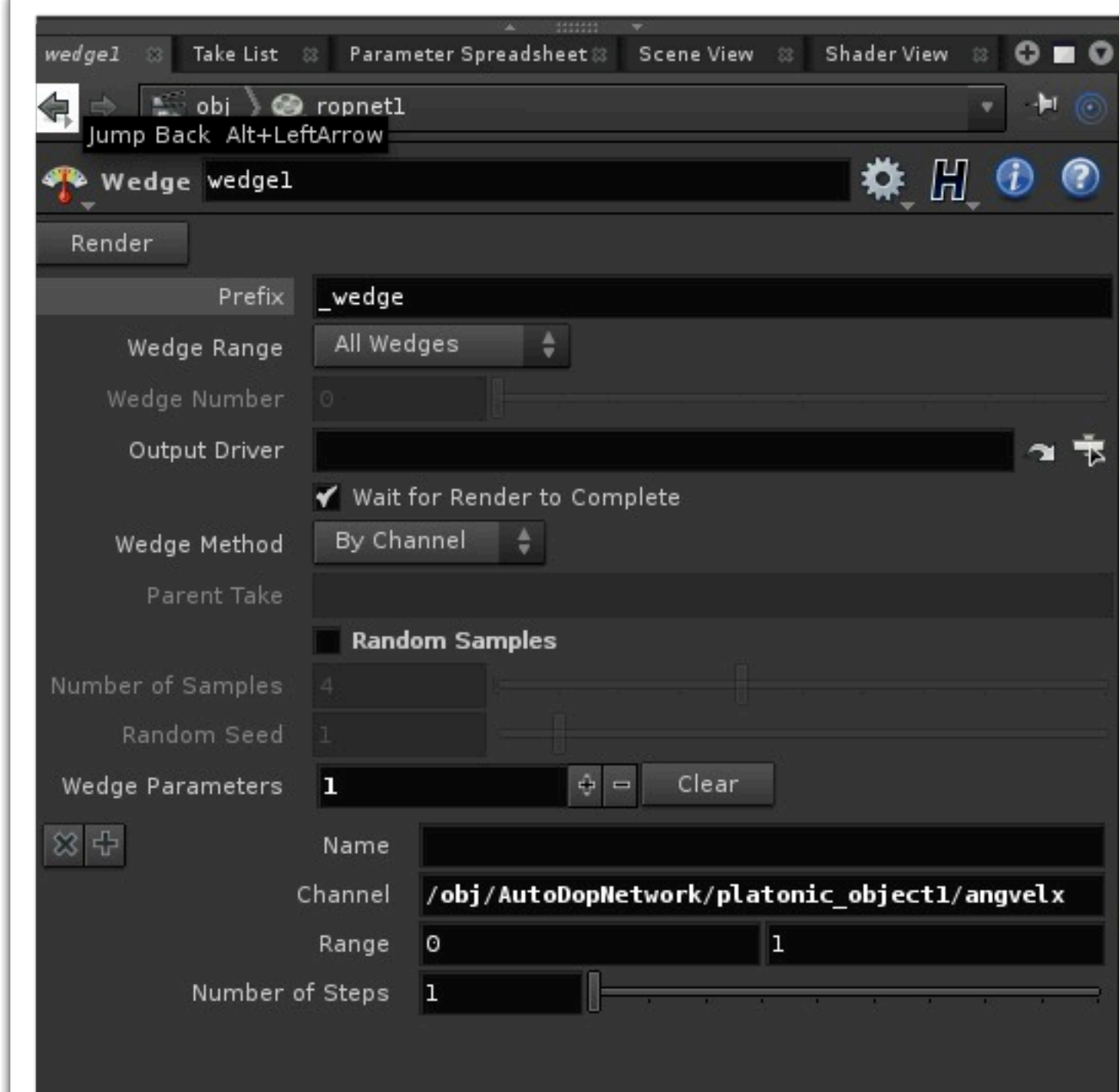
- ▶ At the /OBJ level dive inside the AutoDopNetwork
 - ▶ Select platonic_object1
 - ▶ Change the angular velocity to different values
 - ▶ Copy the parameter for Angular Velocity channel x

Angular Velocity

Wedge Geometry (cont.)



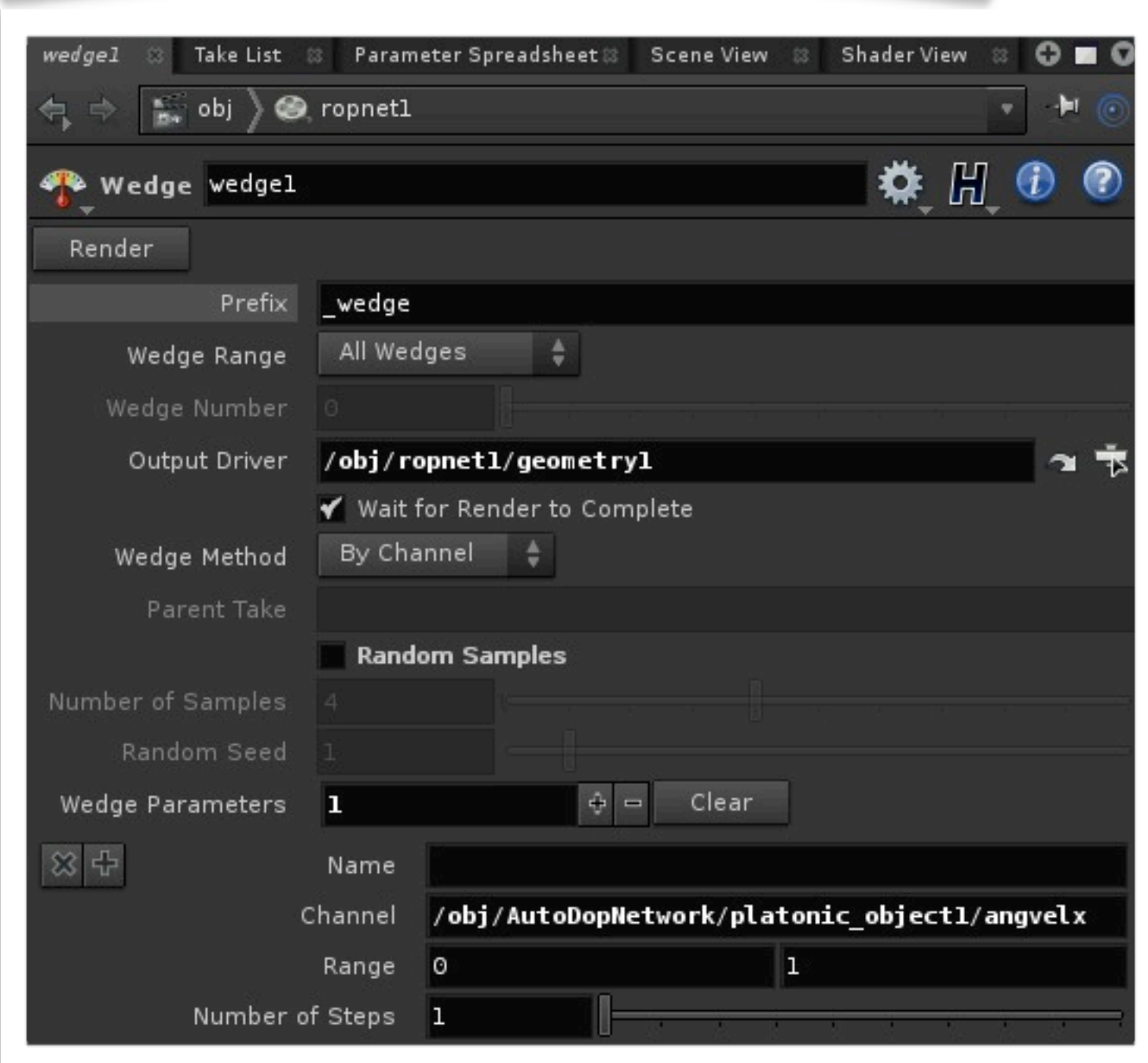
- ▶ Go back to the /Obj level
- ▶ Add a ROPNET
- ▶ Dive into the ROPNET and Drop Down a WEDGE ROP
- ▶ Change Prefix from `_wedge` to `wedge`
 - ▶ The Prefix is added to the front `$WEDGE` variable
- ▶ Turn off “Random Samples”
- ▶ On Wedge Parameters which is now active click the “+” sign
- ▶ On Name type something like “spinner”
- ▶ On Channel “Paste Copied Reference”
- ▶ Delete the `chs()` function leaving only the path



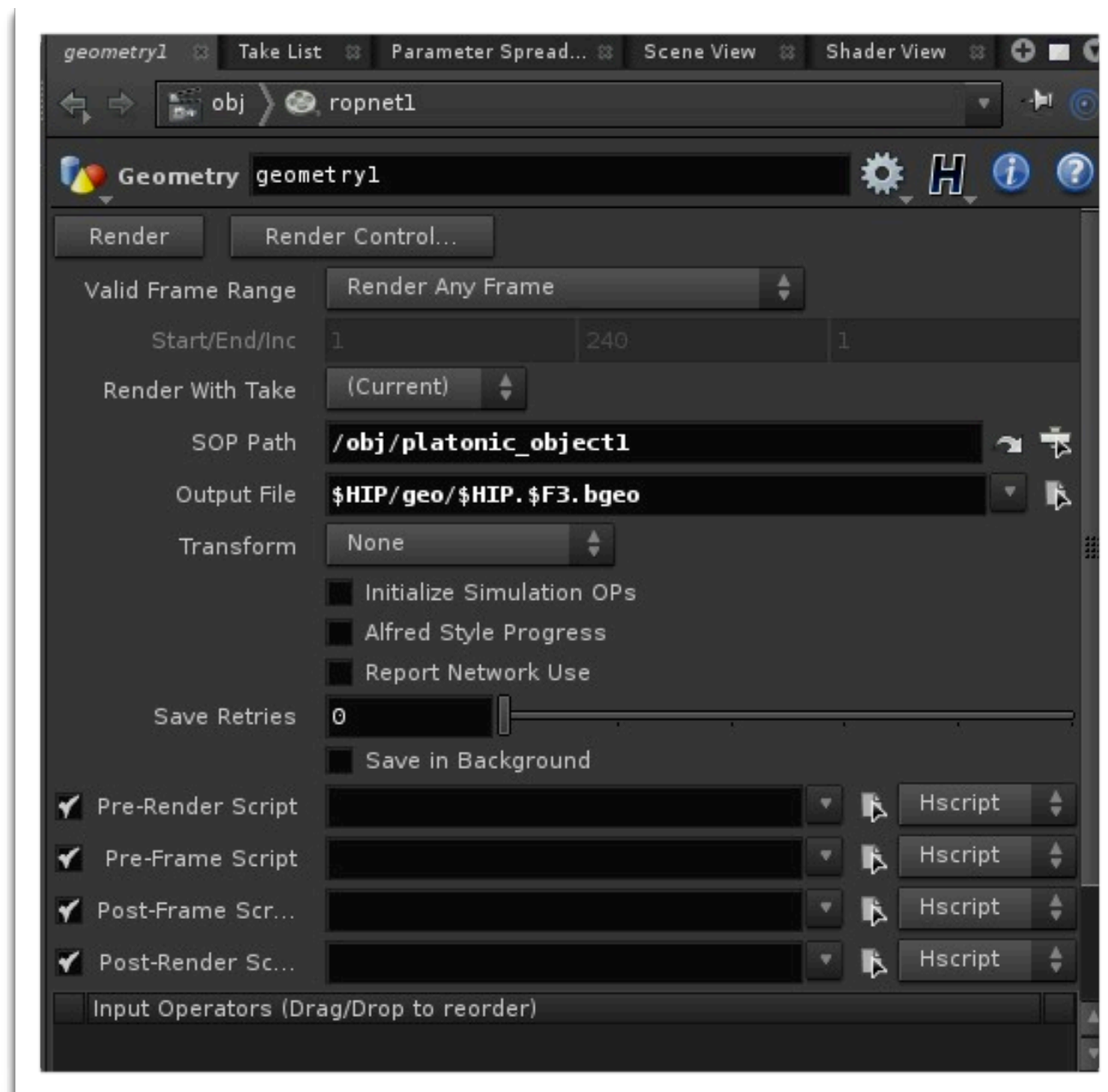
Wedge Geometry (cont.)



- ▶ Now let's cache out the Geometry
- ▶ Add a Geometry ROP
- ▶ In the WEDGE ROP You will see a parameter called Output Driver
 - ▶ Drag and Drop the Geometry ROP onto the parm
- ▶ Still in the Wedge ROP Change the Range parms to 360 and 900
 - ▶ Number of steps say 4 (number of steps divides the range into 4 values.)
 - ▶ The steps are the different angular velocity values that will be cached out

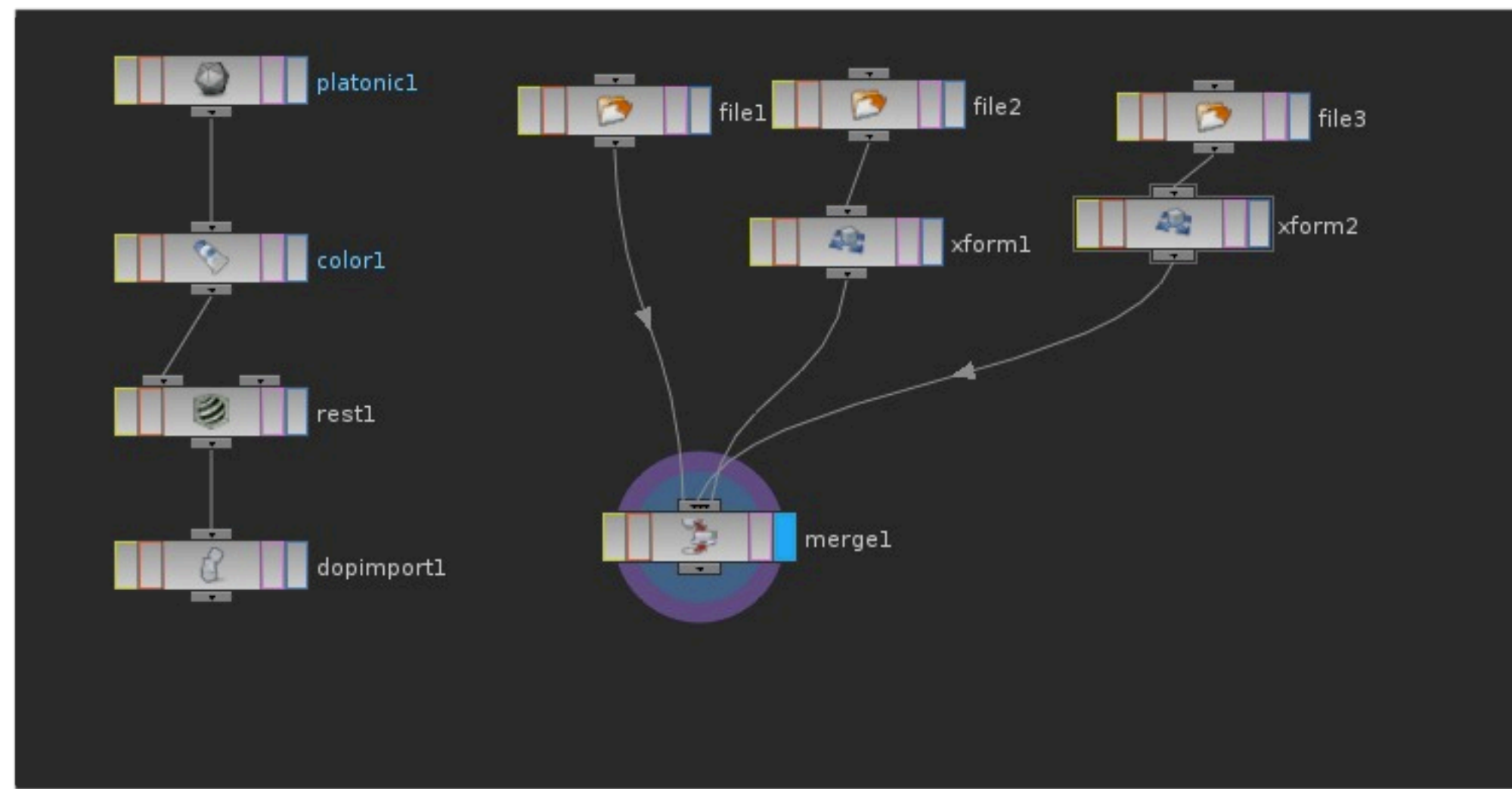


Wedge Geometry (cont.)



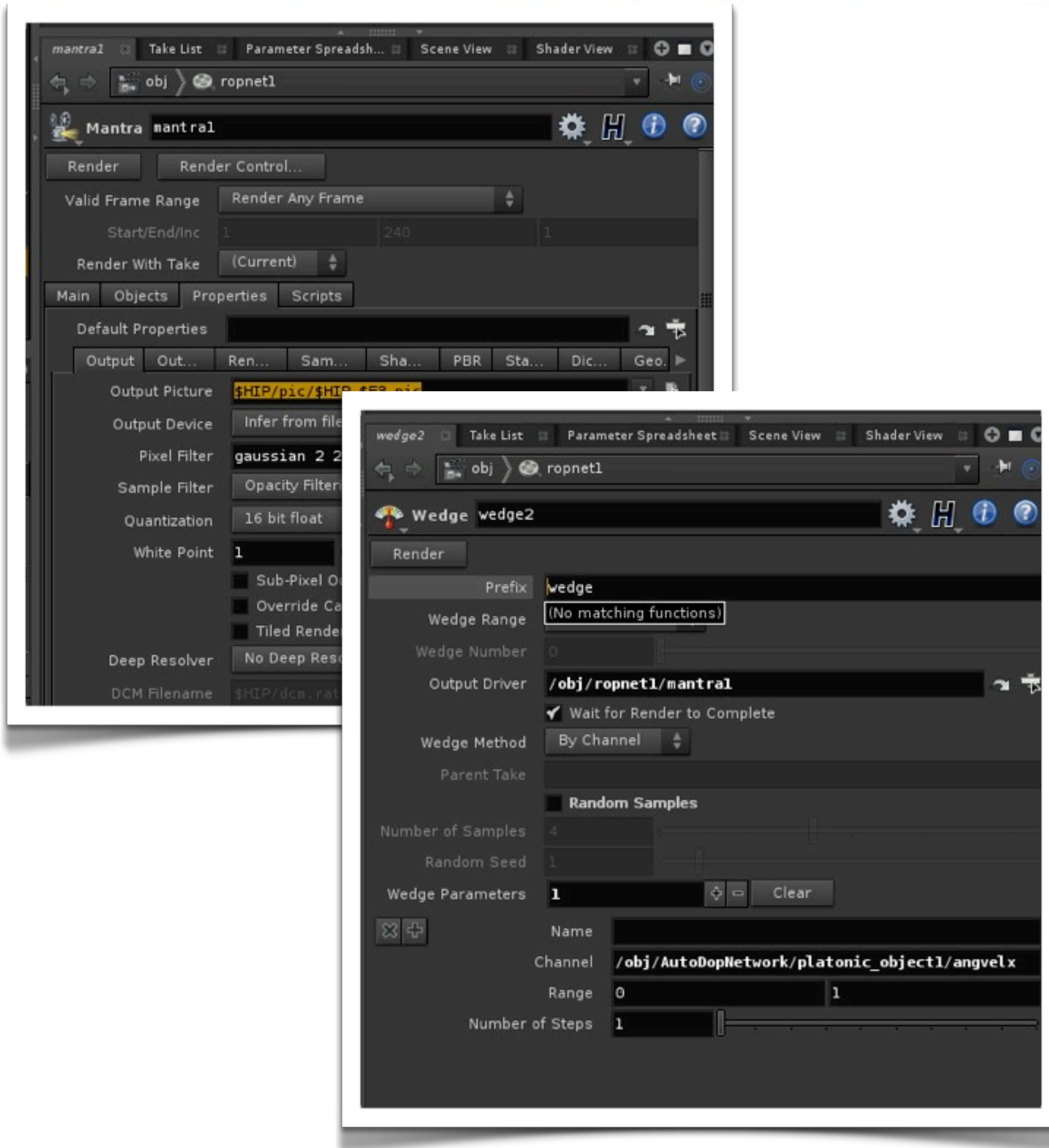
- ▶ In the Geometry ROP add the Geometry you want to cache out
 - ▶ /obj/platonic_object1
- ▶ In the output file create a name with \$WEDGE to differentiate wedges
 - ▶ \$HIP/geo/\$WEDGE.\$F3.bgeo
- ▶ Click the Render button on the Wedge ROP

Reading the Cached Geometry



- ▶ Go back to the /OBJ level
- ▶ Dive into Platonic object
 - ▶ Drop down a File SOP
 - ▶ Load the cached geometry
 - ▶ Repeat for the other two wedges

Wedge Renders



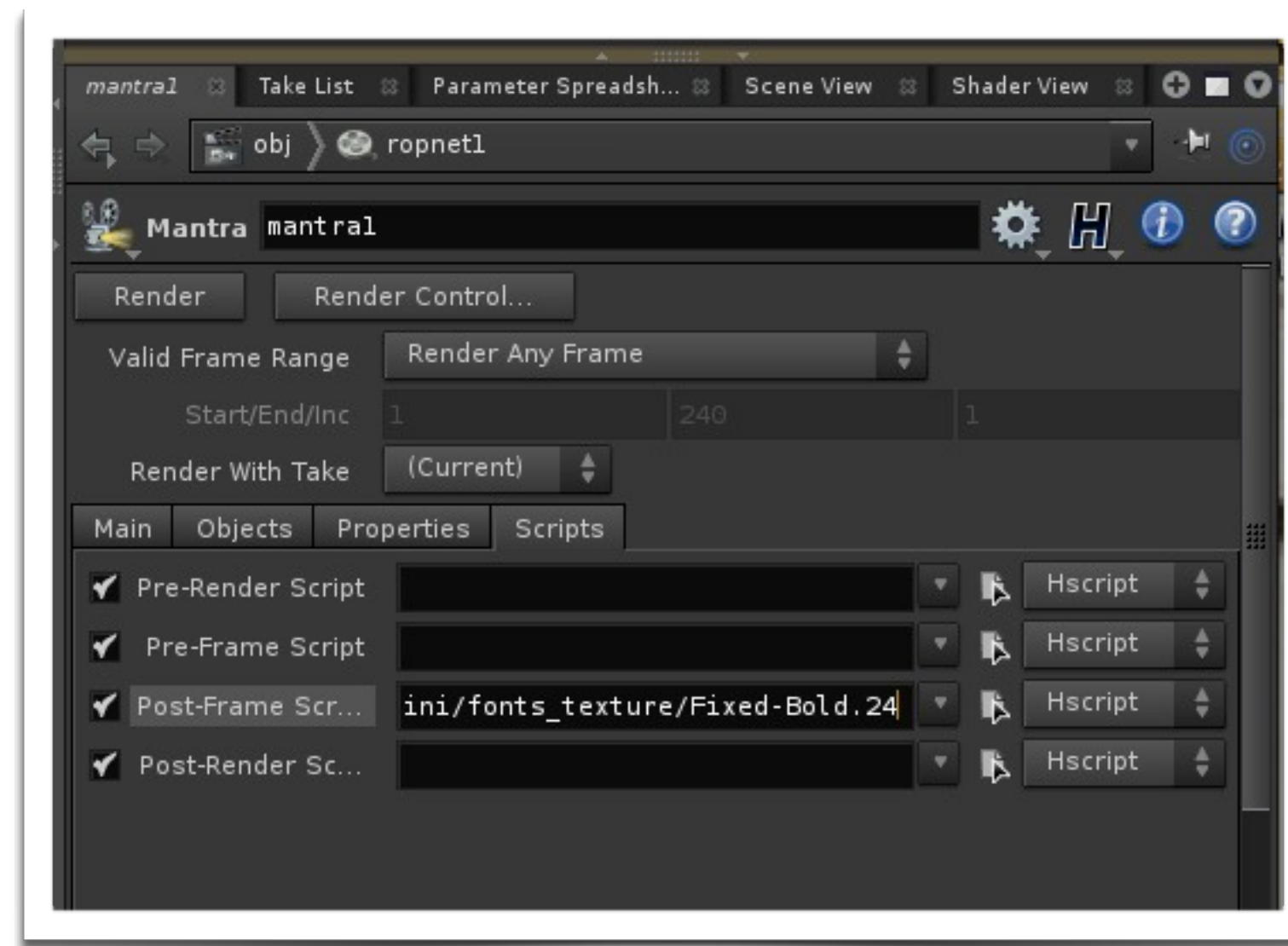
- ▶ Doing the same thing for rendered images
- ▶ Drop down another WEDGE ROP
- ▶ Drop down a Mantra ROP
- ▶ Use the Mantra ROP for the output driver parm of the WEDGE ROP
- ▶ Channel - how about light intensity
 - ▶ Drop down a light
 - ▶ Copy light intensity or color
 - ▶ Paste in the Chanel, delete ch() function
 - ▶ change Range
- ▶ Properties Tab of the Mantra ROP
 - ▶ Output Picture - \$HIP/pic/\$HIP.\$F3.pic

Watermarking your Wedges

- ▶ `unix hwatermark -x 4 10 -m "$WEDGE" `chs("vm_picture")` `chs("vm_picture")` $HFS/houdini/fonts_texture/Fixed-Bold.24`
- ▶ Use it as a Post Script in your Mantra Node
 - ▶ `hwatermark [-q] [-a alpha] [-c r g b] [-x x y] [-j] [-m msg] src.pic dst.pic fontfile`
 - ▶ Where the `src.pic` is the image to watermark, `dst.pic` the file to save the result to, and `fontfile` the full path to the file to use as the font.
 - ▶ - The `-a` option has a parameter, the alpha to use for compositing. It should be in the range 0..255
 - ▶ - The `-c` option has three parameters, the red, green, and blue colours to composite the text in. The should be specified in the range 0..255
 - ▶ - The `-m` option specifies the message to composite onto the image.
 - ▶ - If the `-q` option is present, all text output is suppressed
 - ▶ - The `-x` option has two parameters, the x & y location of the text in the image. It should be specified in pixels.
 - ▶ - The `-j` option specifies right justification.

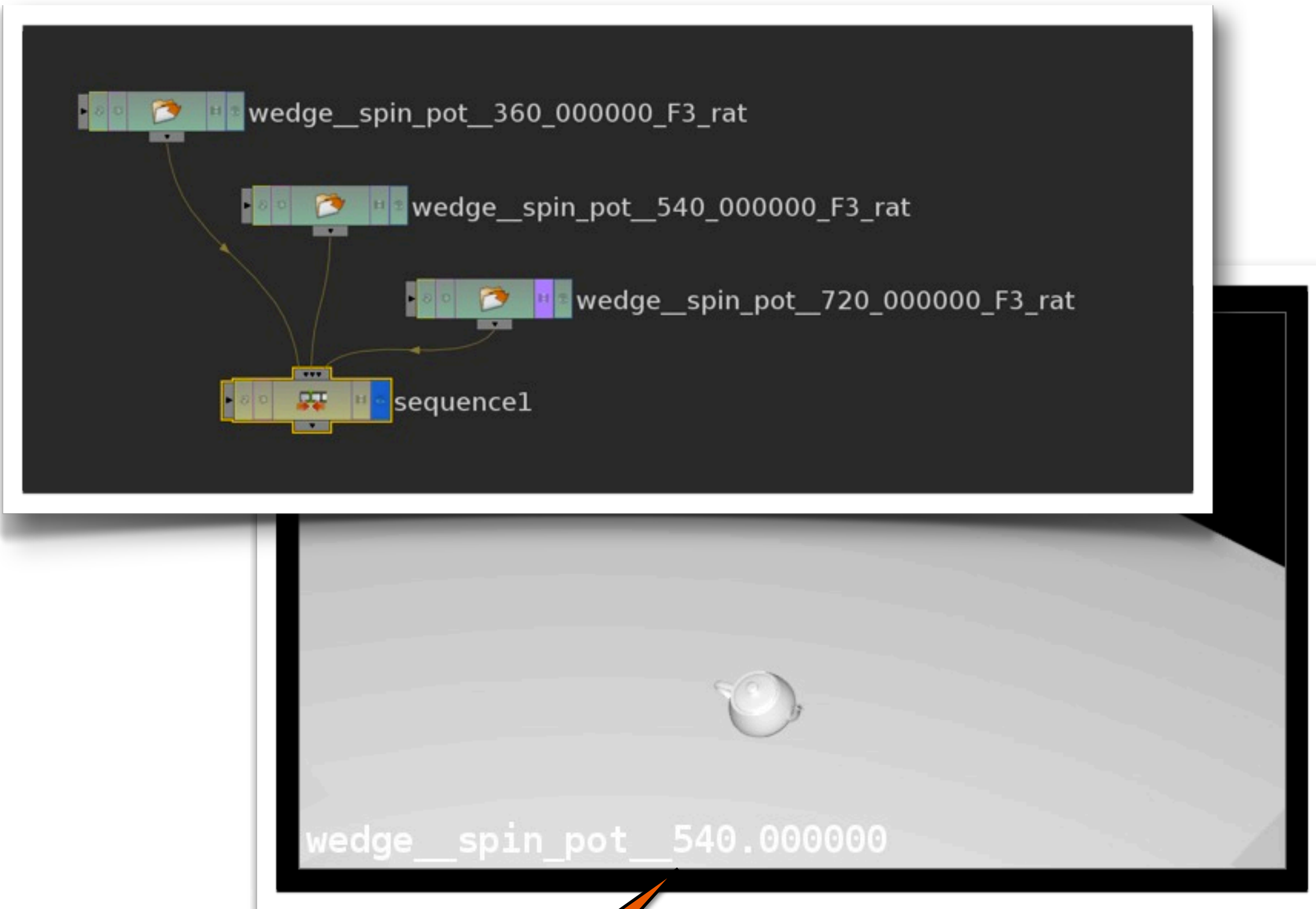
Watermark in Script tab

- ▶ In Mantra Tab click on Scripts Tab
 - ▶ Enter the unix command
- ▶ `unix hwatermark -x 4 10 -m "$WEDGE" `chs("vm_picture")` `chs("vm_picture")` $HFS/houdini/fonts_texture/Fixed-Bold.24`



Hit Render in the WEDGE ROP

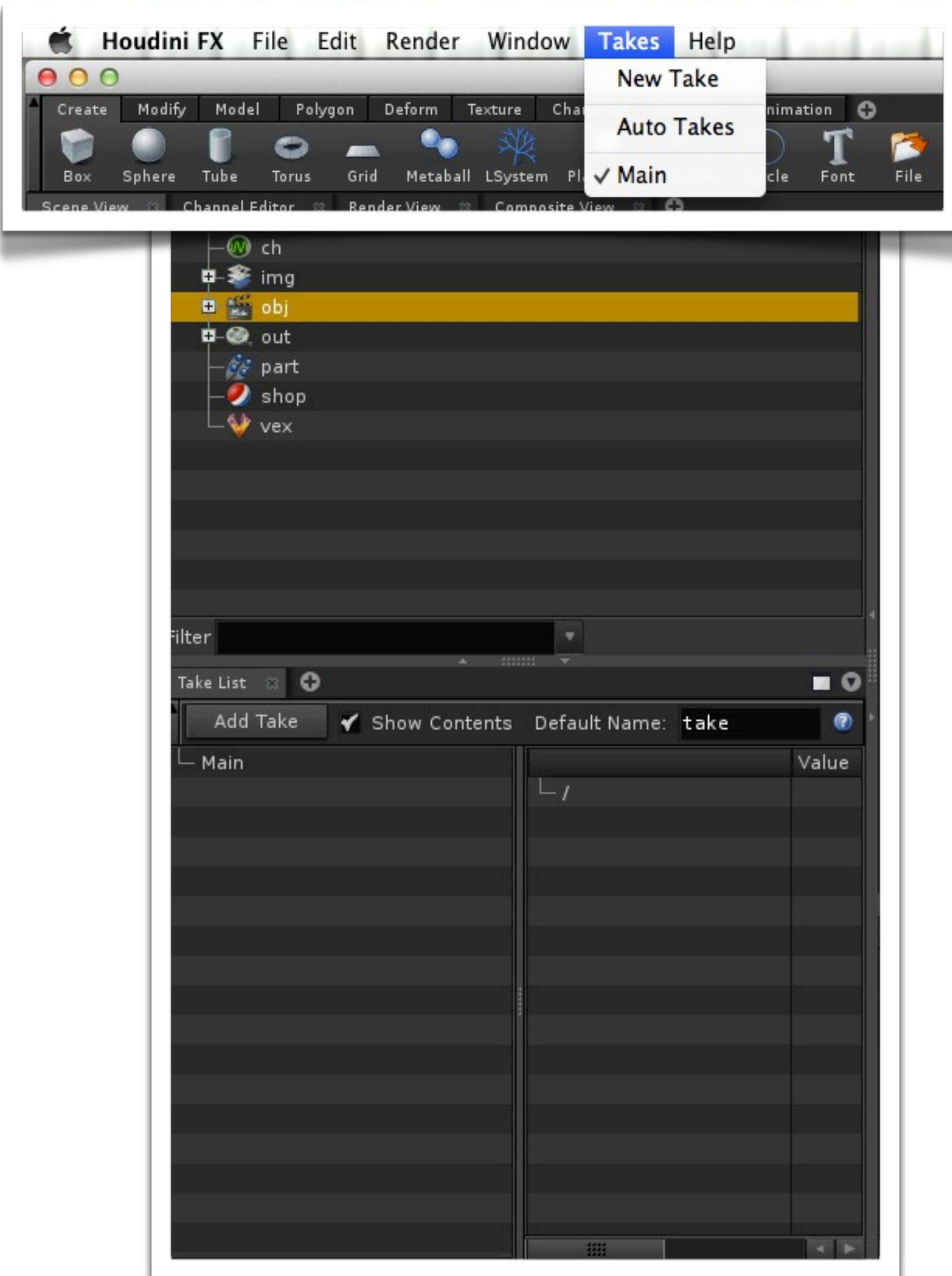
Using a COP to sequence images together



- ▶ At the /obj level
 - ▶ Create a COPNET
 - ▶ Add a file COP and choose your image sequences

Watermark

Takes



- ▶ Takes are useful for:
- ▶ Exploring alternative designs with the ability to switch back and forth to compare the alternatives.
- ▶ Layering tweaks or explorations on top of a “known good” or approved shot/design. You can see which parameters you've changed and easily return to, copy-paste from, etc., the original scene.
- ▶ Holding different sets of parameters for different render passes. You can use the Render with take parameter on render nodes to control which take to use when you render.

Take Interface

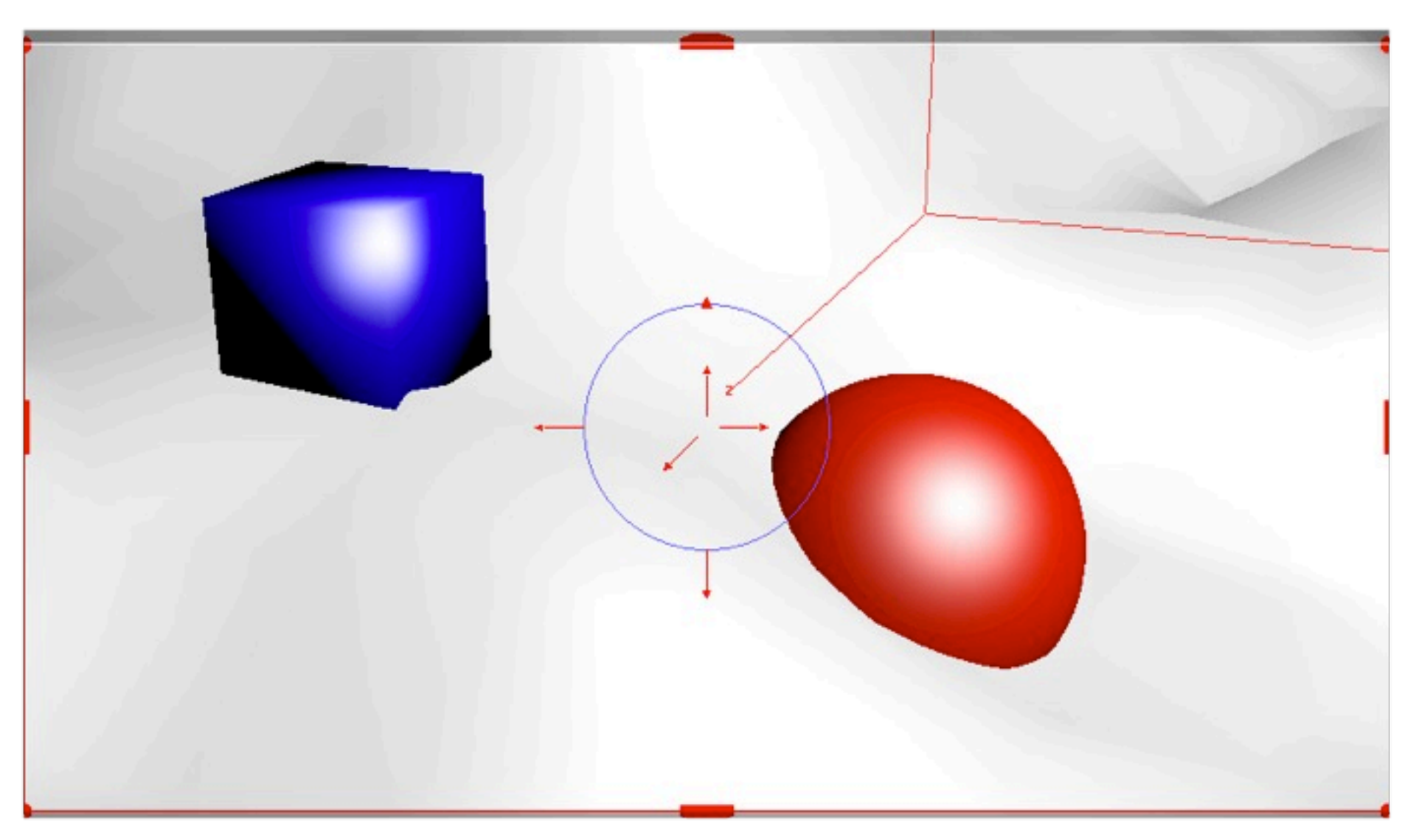
Annotations for the 'Take List' interface:

- Show which parameters are included in the selected take**: Points to the 'Show Contents' checkbox.
- New takes get a default name, starting with this string. Double-click a take name in the list to rename it**: Points to the 'Default Name' text box containing 'take'.
- Create a new take**: Points to the 'Add Take' button.
- Hierarchy of takes**: Points to the tree view showing 'Main' and 'take1'.
- Current take is selected in the list**: Points to the 'Main' item in the tree view.
- The parameters included in the selected take (when Show Contents is on)**: Points to the parameter list area on the right.

Annotations for the 'Auto Takes' menu:

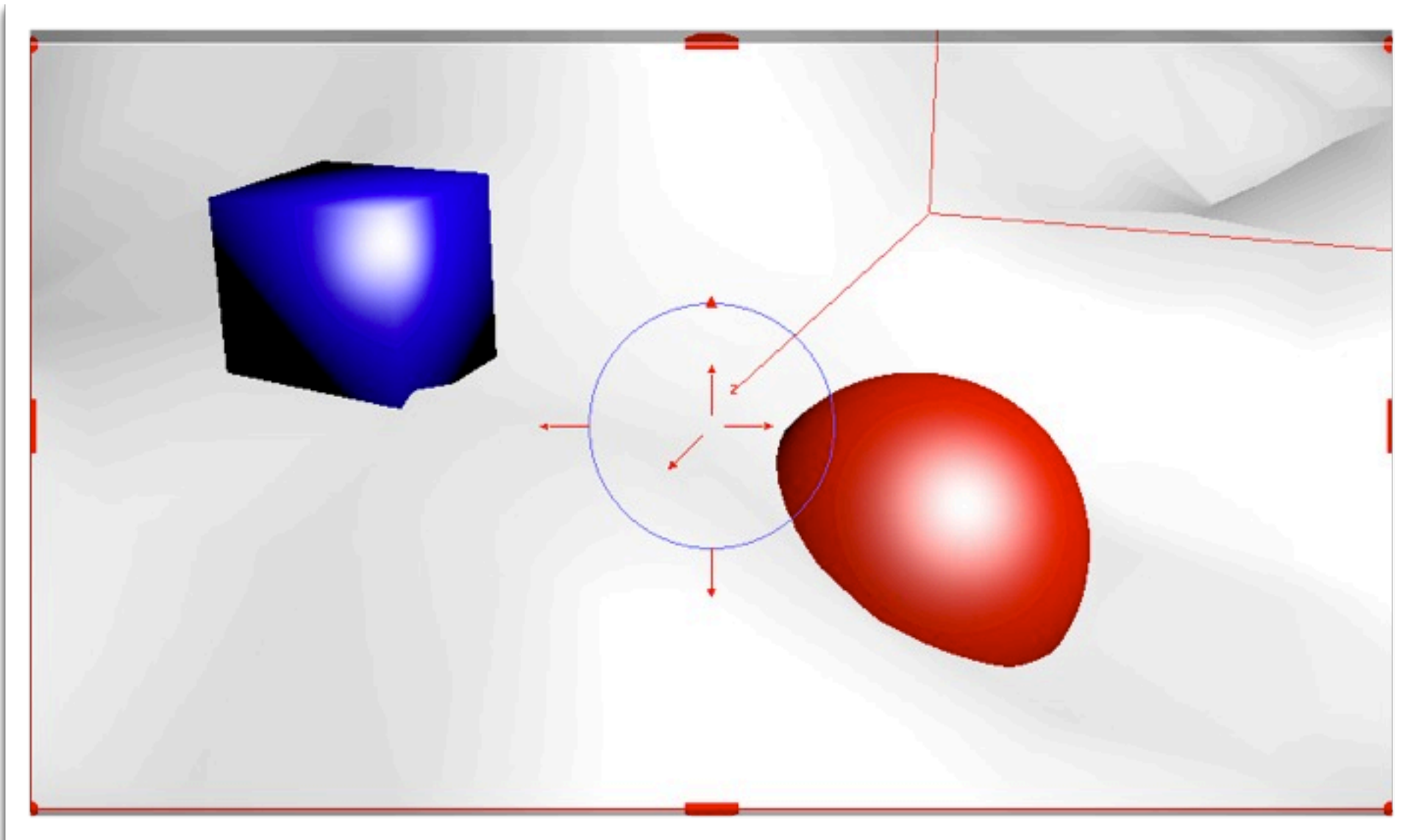
- Automatically add parameters to the current take when you change them**: Points to the 'Auto Takes' checkbox.
- Choose this item to create a new take**: Points to the 'New Take' menu item.
- This menu shows the current take**: Points to the 'Main' item in the dropdown menu.

Take Example 1



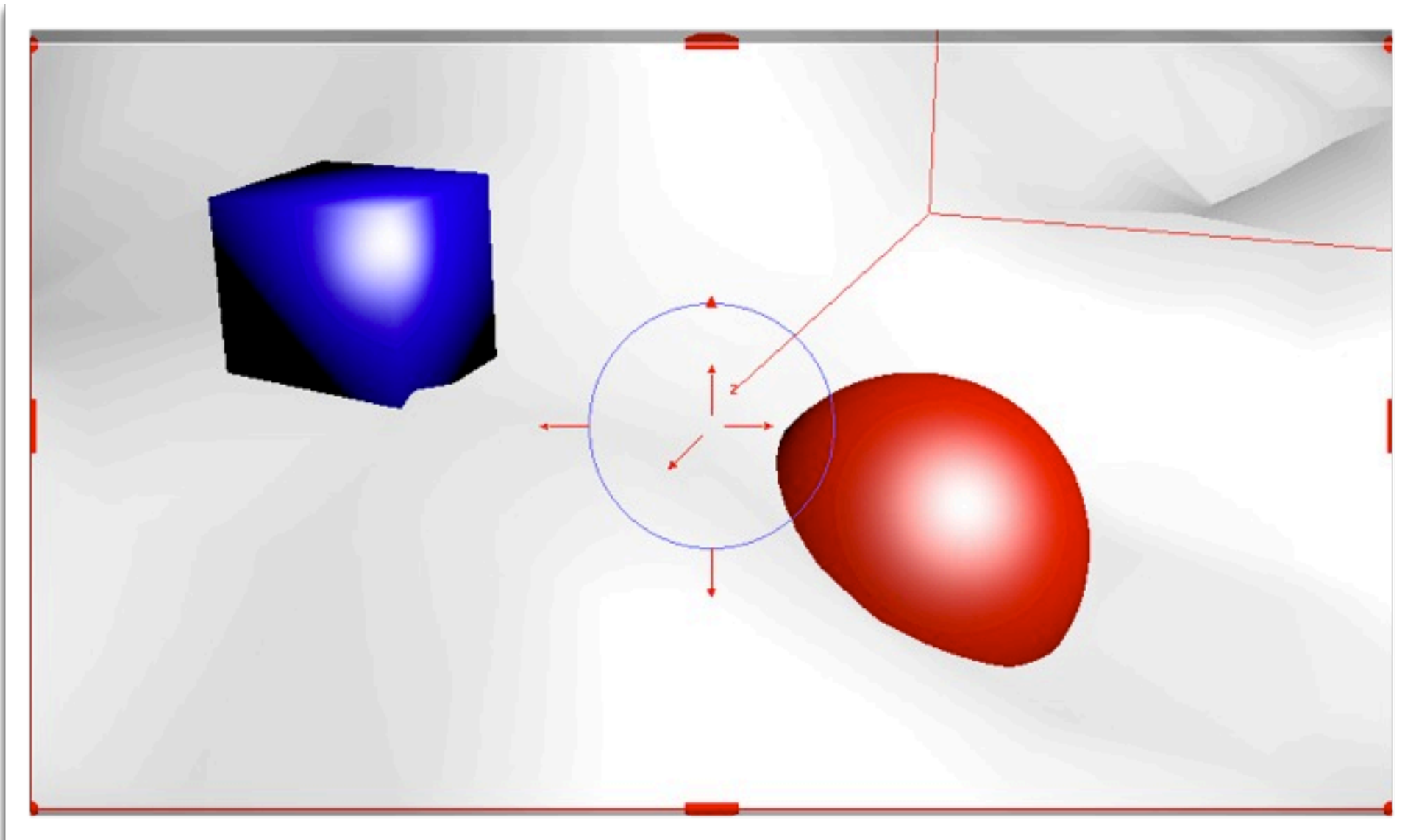
- ▶ Leave the Terrain and delete everything else
- ▶ Place a sphere and a cube on the terrain
- ▶ Color the geometry
- ▶ Add a Spot Light
- ▶ Add a Camera

Take Example 1 (cont.)



- ▶ Leave the Terrain and delete everything else
- ▶ Place a sphere and a cube on the terrain
- ▶ Color the geometry
- ▶ Add a Spot Light
- ▶ Add a Camera

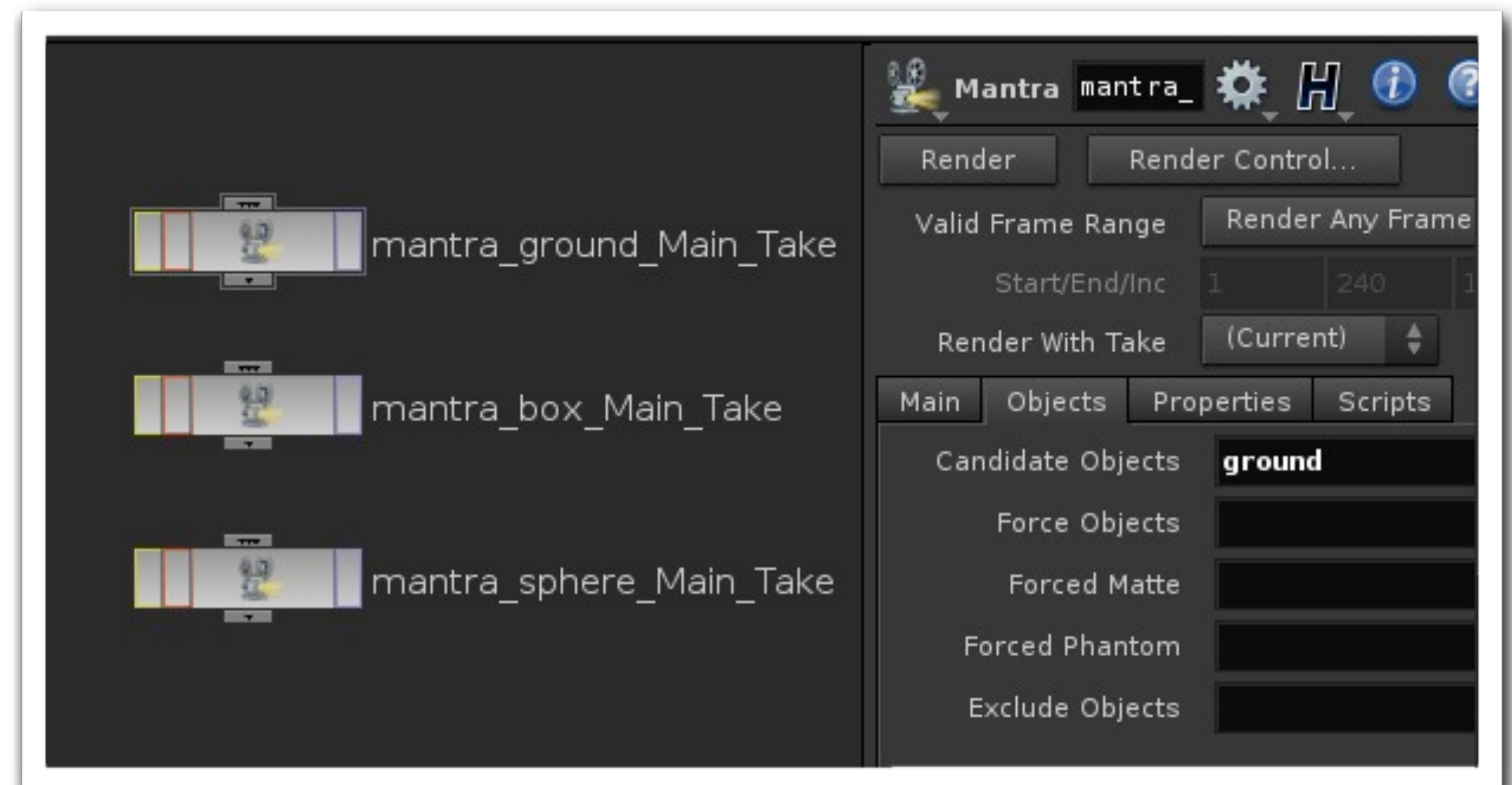
Take Example 1 (cont.)



- ▶ In the Take List add a Take
 - ▶ Select the Sphere OBJ
 - ▶ Notice all parms not active
 - ▶ lets add an expression to Translate y
 - ▶ $\text{abs}(\sin(\$F*5))$
 - ▶ Right click on translate y
 - ▶ Select “Include Take”
 - ▶ Look at Take List
 - ▶ Enter the Expression
 - ▶ Select “Main” on the take list
 - ▶ Play animation - No bounce
 - ▶ Select Take 1, play animation - Bounce

Take Example 2 - Render Passes

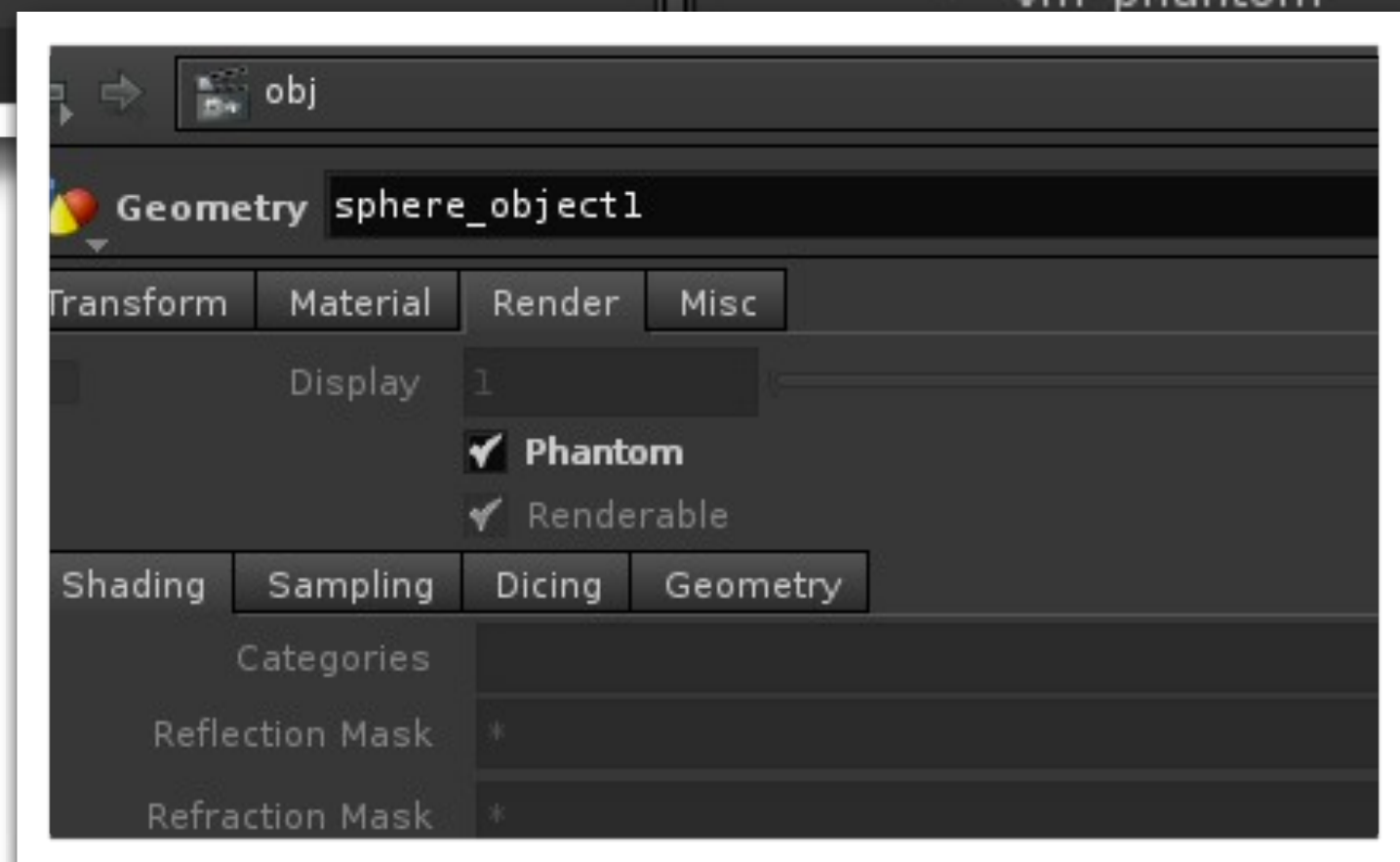
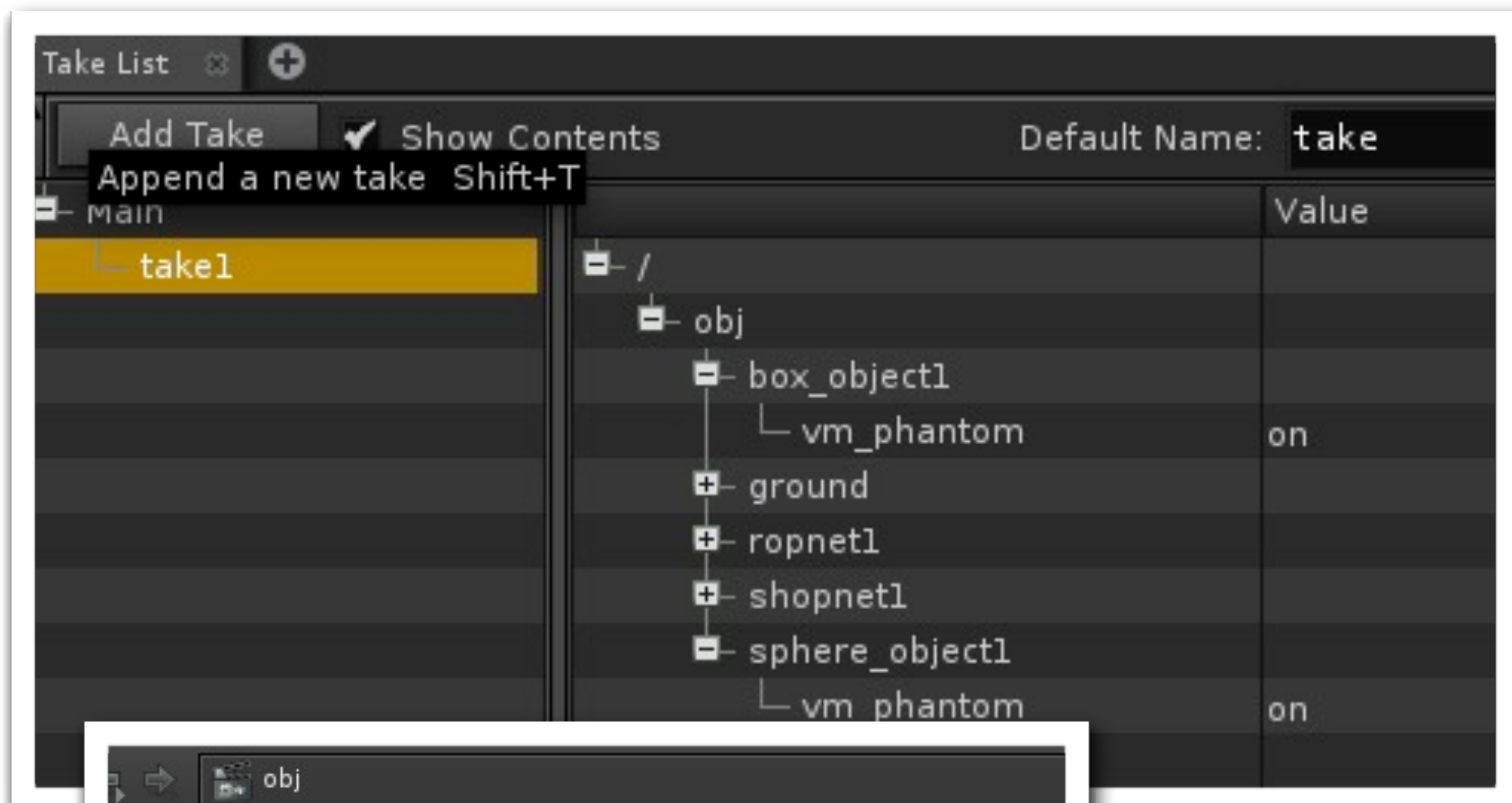
- ▶ Delete Take 1 from Previous Example
- ▶ Create a ROPNET at obj level
- ▶ Working from back to front
 - ▶ Drop down Mantra Node an in candidate object select terrain
 - ▶ Drop down another Mantra Node and in candidate select box
 - ▶ Repeat for sphere



Take Example 2 - Render Passes

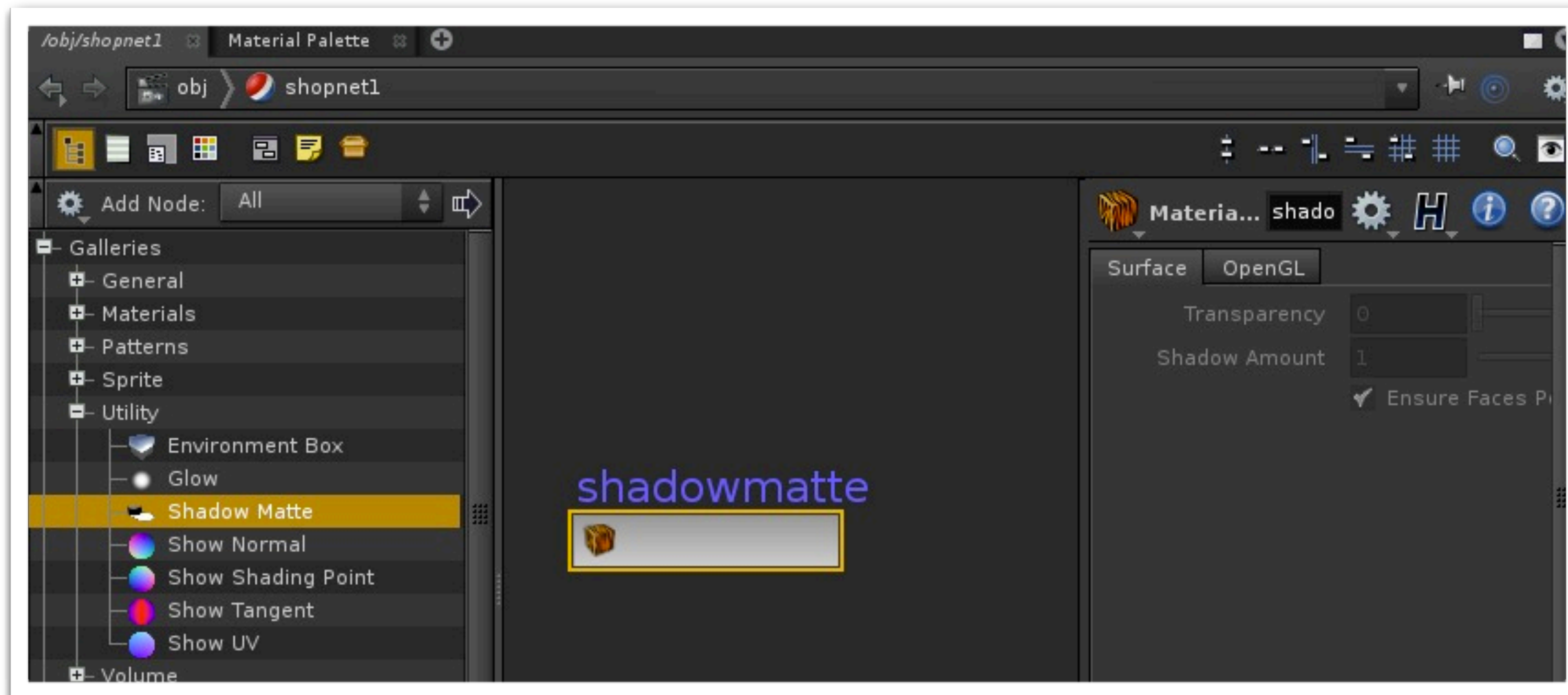
- ▶ Go back to /obj level
 - ▶ add a Take
 - ▶ sphere object
 - ▶ In render tab “include in Take” the Phantom option. and select
 - ▶ Repeat for box
 - ▶ At object level drop down a SHOPNET
 - ▶ Dive inside
 - ▶ add a Shadow Matte
 - ▶ Select the Terrain
 - ▶ Go to Material Tab “include in Take” Material
 - ▶ Add Shadow Matte

Take Example 2 - Render Passes



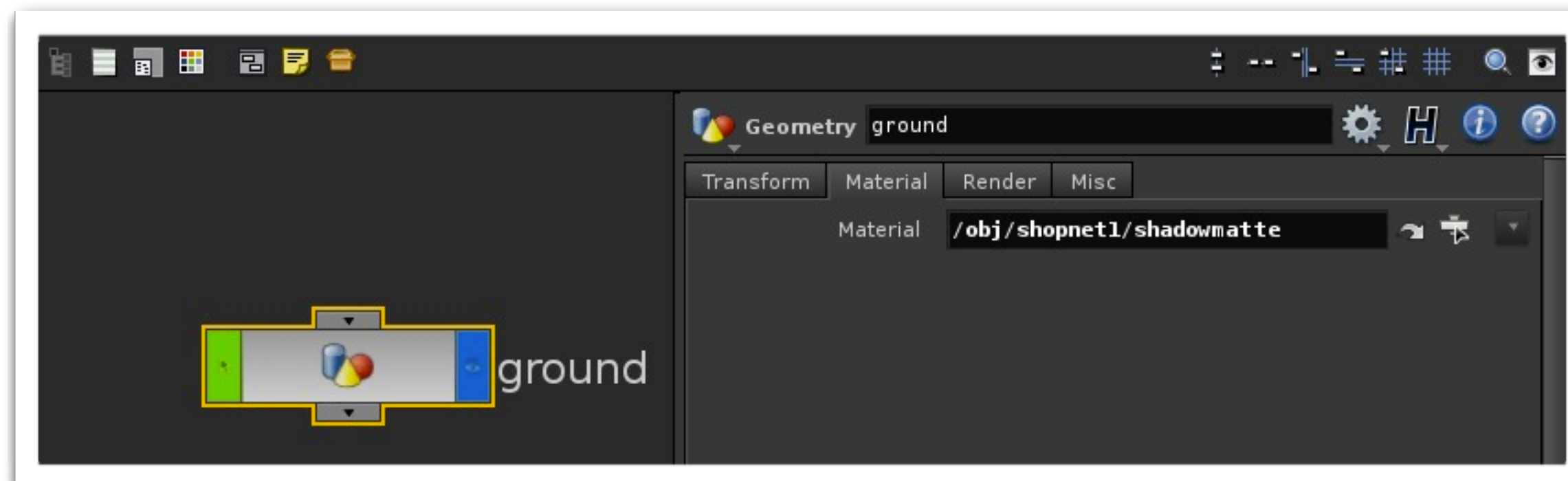
- ▶ Go back to /obj level
- ▶ add a Take
- ▶ sphere object
 - ▶ In render tab “include in Take” the Phantom option. and select
- ▶ Repeat for box
- ▶ At object level drop down a SHOPNET
 - ▶ Dive inside
 - ▶ add a Shadow Matte
- ▶ Select the Terrain
 - ▶ Go to Material Tab “include in Take” Material
 - ▶ Add Shadow Matte

Take Example 2 - Render Passes



- ▶ At object level drop down a SHOPNET
 - ▶ Dive inside
 - ▶ add a Shadow Matte

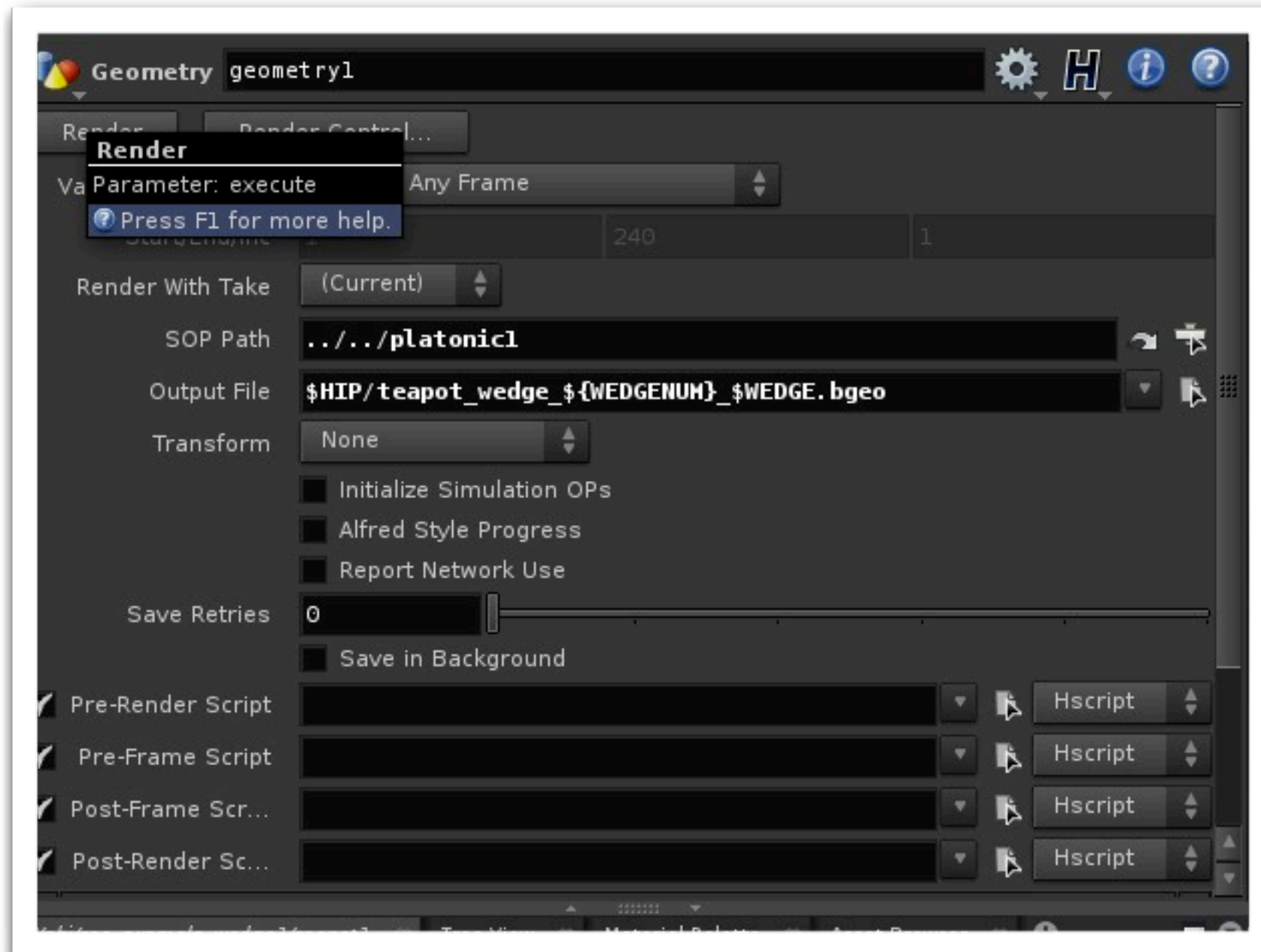
Take Example 2 - Render Passes



Select the Terrain

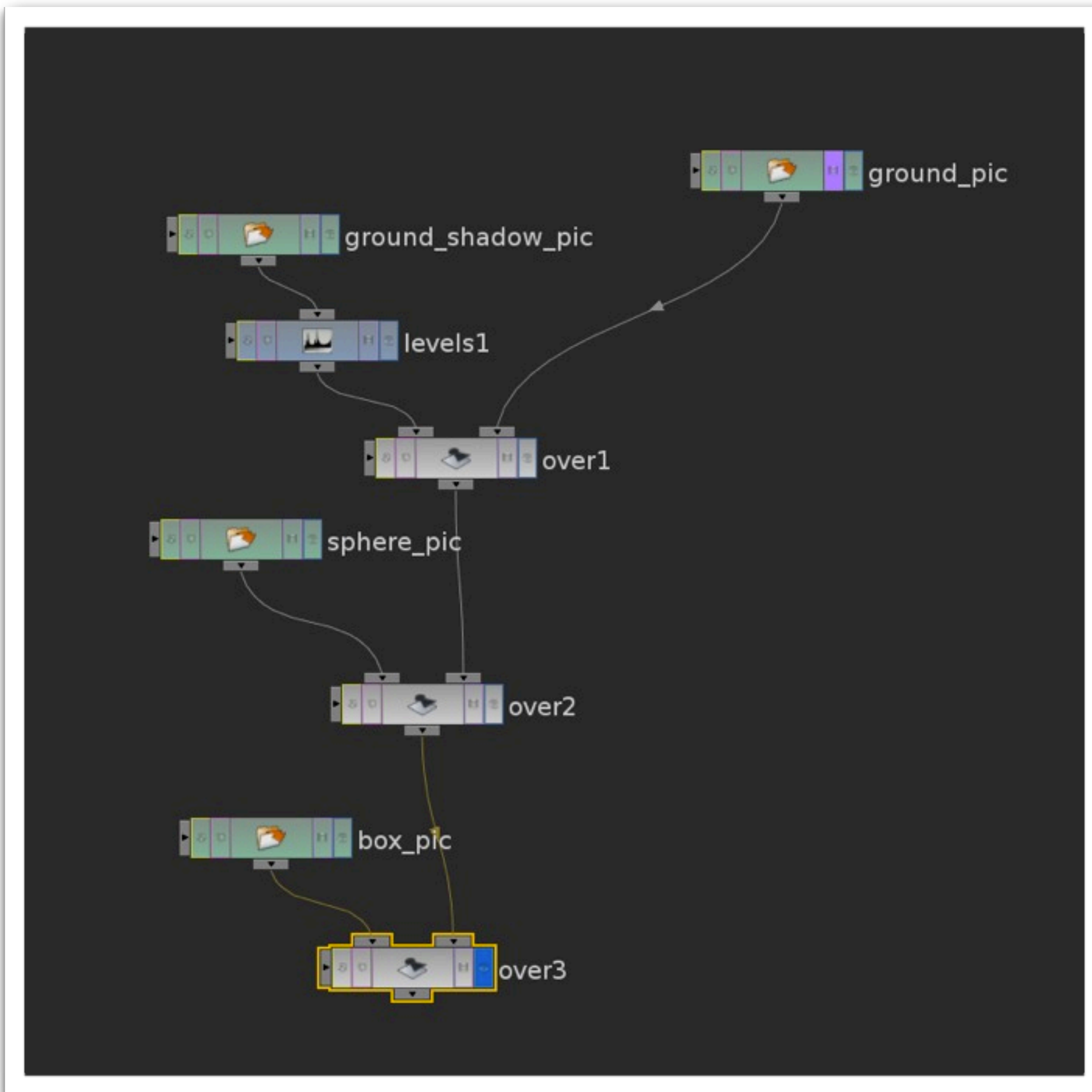
- ▶ Go to Material Tab “include in Take” Material
- ▶ Add Shadow Matte

Take Example 2 (cont.)



- ▶ Go back to main take
- ▶ Drop Down into the ROPNET
- ▶ Add another mantra Node
 - ▶ Change Render with Take to “Take 1”
 - ▶ Candidate object is terrain
- ▶ go Up to /obj level
- ▶ Click Render for Each Mantra Node

Composite Render Node



- ▶ Drop Down a COPNET
- ▶ Switch to Composite View
- ▶ Work from Back to Front
 - ▶ Terrain
 - ▶ Ground Shadow
 - ▶ Sphere
 - ▶ Box

Composite End Result

