

QuadSpinner

MDK I.I  
Material Development Kit  
User Manual

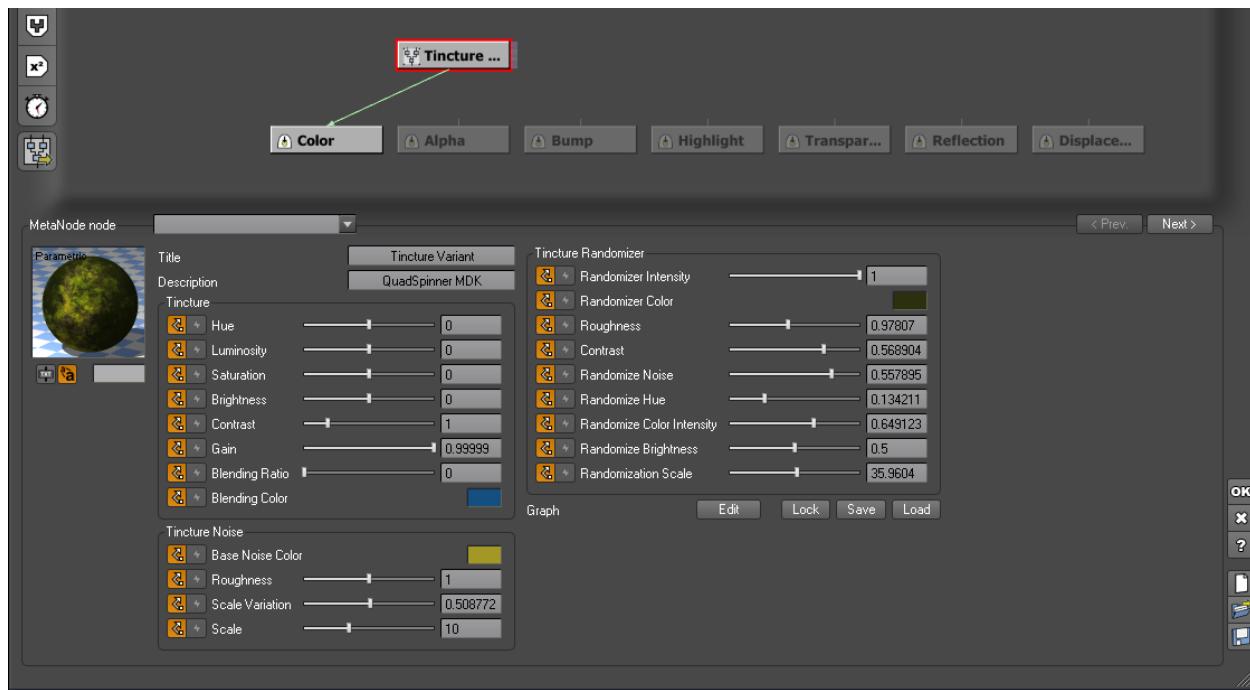
# Installation and Usage

The QuadSpinner MDK 1.1 ships in the form of 5 components with 2 sets of files for each – MetaNodes and Kickstart Materials. Inside the ZIP file for each component you will find 2 folders: MetaNodes and Materials.

## NOTE

MDK 1.1 is meant for Vue 9.5 and higher. If you are using Vue 8.5, or need the MDK 1.0 legacy version, please see the MDK 1.0 folder in the aforementioned ZIP file for the correct files and associated manual.

## MetaNodes

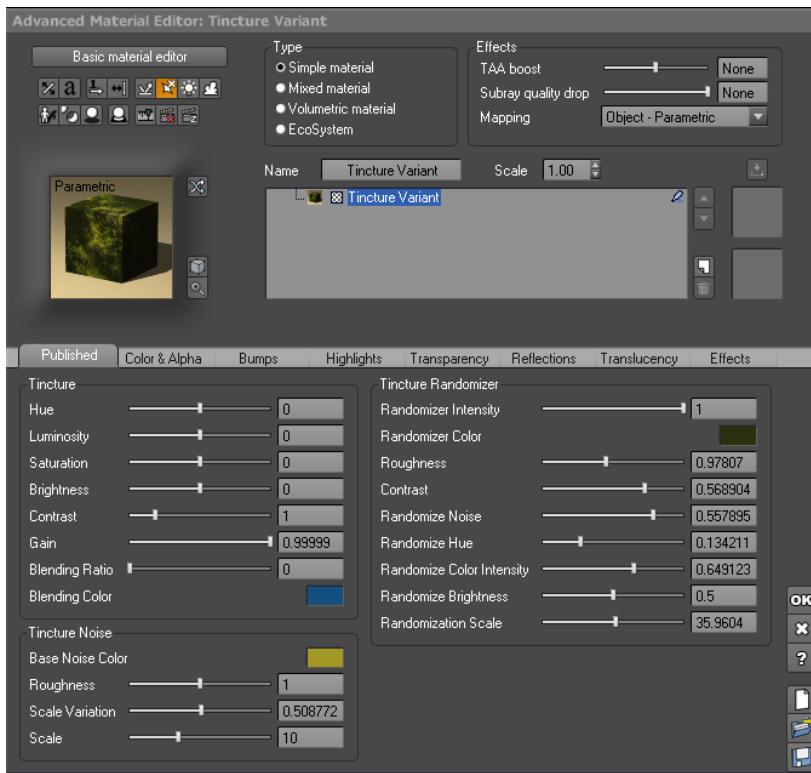


The MetaNodes are .MND files that can be loaded inside the Function Editor, and connected to appropriate Nodes and Channels. The compatible input and output types for each component are listed in this manual.

Additionally, you may use a Convertor to change Double/Numbers to Colors, and vice versa to allow usage in Channels that may not be directly compatible. For example, you can convert the Color output of a Tincture MetaNode to a Double/Number output to assign to the Bump Channel.

The MetaNodes are meant for advanced users who may wish to integrate them in their own materials and other functions.

## Kickstart Materials



The Kickstart Materials are meant for both basic and advanced users. These materials have been optimized for efficiency and easy application to your objects. Simply load the material, like any typical Vue material.

The Kickstart Materials are especially useful if you are not experienced with the Function Editor, or require a simple and quick solution.

All Kickstart Materials have their MDK component exposed directly in the Advanced Material Editor. You can modify the MDK component settings in the Published tab, bypassing the need to go inside the Function Editor.

### NOTE

To connect any compatible parameter via 'Extract Parameter', you may need to go inside the Function Editor and un-publish that Parameter. If you extract a parameter, it will be removed from the Published tab and can only be accessed inside the Function Editor.

### WARNING

It is illegal to share, sell, or otherwise distribute any Vue files, materials, or functions with any MDK MetaNode inside it. Please contact [info@quadspinner.com](mailto:info@quadspinner.com) for an unlocked version for such usage.

# Tincture

## **MetaNode Type**

Color Map and Color Noise Production

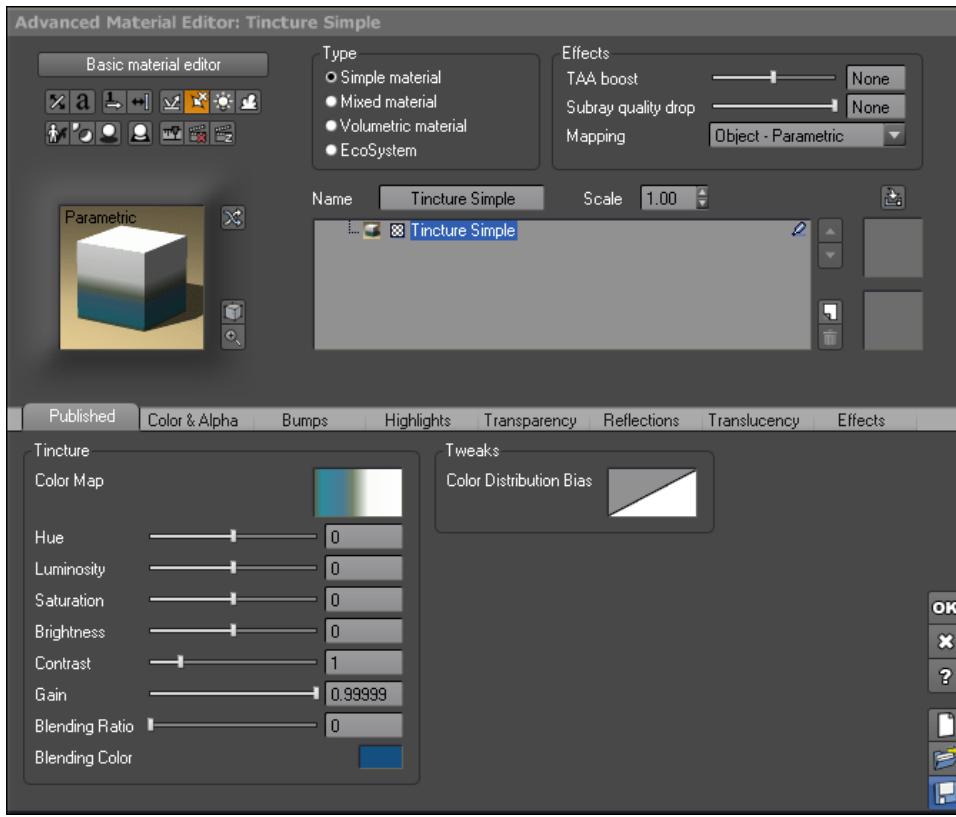
## **Output Type**

Color

## **Input Type**

Self-Contained / Vector

# Simple



Tincture's **Simple** MetaNode is the lightest MetaNode in the component. It can be used to replace the default Color Map node in the Function Editor. The main advantage of Tincture is the ability to modify or tweak the Color Map without having to add more nodes.

## TINCTURE

### Color Map

The Color Map is the traditional gradient that can be used just like Vue's default Color Map.

### Hue / Saturation / Luminosity

These controls provide familiar color correction methods found in all paint programs. However, please note that the range of these sliders will go far beyond commonly found HSL controls. The expanded range is provided for detailed control over the colors. It is recommended that you use small increments until you are familiar with the intensity of the changes.

## Brightness and Contrast

Like HSL, these controls provide common color correction parameters. Just like the other sliders, the range of Brightness and Contrast is also expanded. Use very small increments to get the desired effect.

### Gain

Apart from Brightness, Contrast, and Luminosity, the Gain parameter provides additional control over color intensity by tweaking the overall gain of the Color Map.

## Blending Color and Ratio

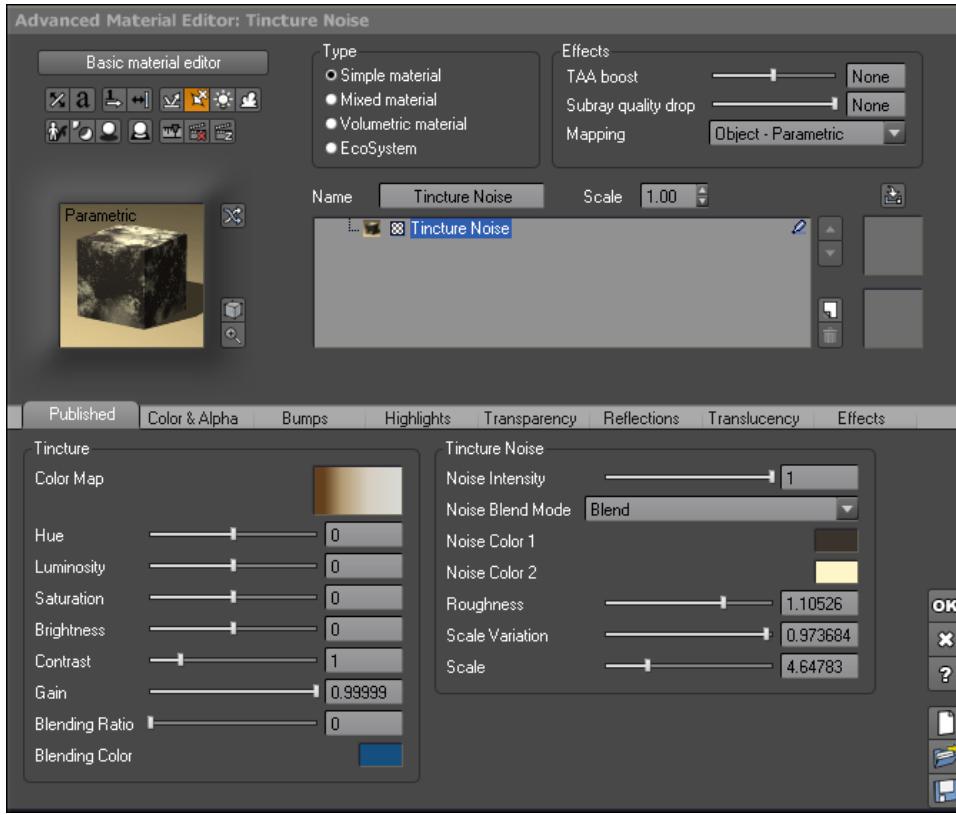
By selecting a Blending Color, the Color Map can be blended with a single color to achieve uniformity. The Blending Ratio parameter can be used to control the ratio between the Blending Color and the original Color Map.

## TWEAKS

### Color Distribution Bias

This special filter allows you to bias the Color Map across the input fractal or other pattern. This is especially helpful when you want to shift the flow of color across the fractal with precision while avoiding the need to alter the Color Map.

# Noise



The **Tincture Noise** MetaNode adds a natural noise layer on top of the Simple MetaNode construct. The color output from this MetaNode creates a more believable color range as it mimics nature's randomness.

## TINCTURE

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The Color Map is the traditional gradient that can be used just like Vue's default Color Map.

### Hue / Saturation / Luminosity

These controls provide familiar color correction methods found in all paint programs. However, please note that the range of these sliders will go far beyond commonly found HSL controls. The expanded range is provided for detailed control over the colors. It is recommended that you use small increments until you are familiar with the intensity of the changes.

## Brightness and Contrast

Like HSL, these controls provide common color correction parameters. Just like the other sliders, the range of Brightness and Contrast is also expanded. Use very small increments to get the desired effect.

## Gain

Apart from Brightness, Contrast, and Luminosity, the Gain parameter provides additional control over color intensity by tweaking the overall gain of the Color Map.

## Blending Color and Ratio

By selecting a Blending Color, the Color Map can be blended with a single color to achieve uniformity. The Blending Ratio parameter can be used to control the ratio between the Blending Color and the original Color Map.

## TINCTURE NOISE

### Noise Intensity

This parameter controls the intensity with which the original Color Map is infused with the Tincture Noise parameters.

### Noise Blend Mode

Consisting of the standard blending modes such as Blend, Add, Subtract, Min, Max, Multiply, and Divide; the Noise Blend Mode parameter lets you define exactly how the colors of the noise production are mixed with the Color Map.

### Noise Color 1 + Noise Color 2

These Noise Color parameters define the basic seed from which the rest of the colors are produced in the noise output. Somewhat contrasting color tones are usually recommended for best results.

### Roughness

This parameter controls the intensity with which finer details and general complexity in the noise are produced. High values may create too much noise.

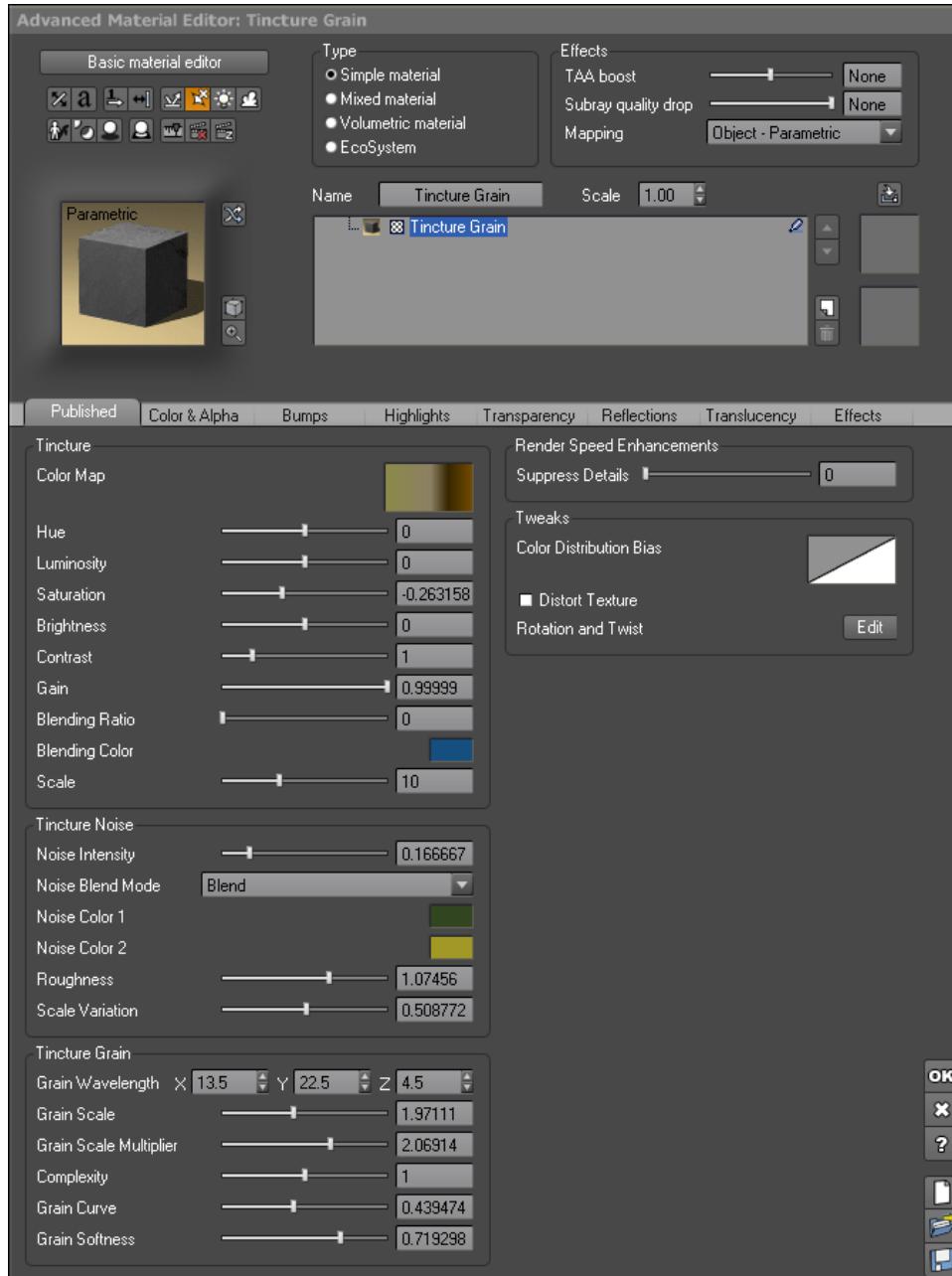
### Scale Variation

This parameter controls the general size of the noise's variation. It takes the Scale parameter's values and creates larger cluster variations based on value.

### Scale

This parameter controls the individual size of the noise-producing clusters. The value may need to be altered depending on the size of the object hosting the material.

# Grain



The complex **Grain** MetaNode builds on top of both the Simple and Noise color nodes, by adding a pattern-producing Grain fractal based on multiple Perlin-type noises and a Grainy Fractal. Additionally, the Color Map is now routed through the Grain output, to channel the colors to the shape of those fractals while adding a layer of randomized noise to maintain a natural feel.

## TINCTURE

### Color Map

The Color Map is the traditional gradient that can be used just like Vue's default Color Map.

### Hue / Saturation / Luminosity

These controls provide familiar color correction methods found in all paint programs. However, please note that the range of these sliders will go far beyond commonly found HSL controls. The expanded range is provided for detailed control over the colors. It is recommended that you use small increments until you are familiar with the intensity of the changes.

### Brightness and Contrast

Like HSL, these controls provide common color correction parameters. Just like the other sliders, the range of Brightness and Contrast is also expanded. Use very small increments to get the desired effect.

### Gain

Apart from Brightness, Contrast, and Luminosity, the Gain parameter provides additional control over color intensity by tweaking the overall gain of the Color Map.

### Blending Color and Ratio

By selecting a Blending Color, the Color Map can be blended with a single color to achieve uniformity. The Blending Ratio parameter can be used to control the ratio between the Blending Color and the original Color Map.

## TINCTURE NOISE

### Noise Intensity

This parameter controls the intensity with which the original Color Map is infused with the Tincture Noise parameters.

### Noise Blend Mode

Consisting of the standard blending modes such as Blend, Add, Subtract, Min, Max, Multiply, and Divide; the Noise Blend Mode parameter lets you define exactly how the colors of the noise production are mixed with the Color Map.

### Noise Color 1 + Noise Color 2

These Noise Color parameters define the basic seed from which the rest of the colors are produced in the noise output. Somewhat contrasting color tones are usually recommended for best results.

## Roughness

This parameter controls the intensity with which finer details and general complexity in the noise are produced. High values may create too much noise.

## Scale Variation

This parameter controls the general size of the noise's variation. It takes the Scale parameter's values and creates larger cluster variations based on value.

# TINCTURE GRAIN

## Grain Wavelength

The Wavelength is the main parameter that controls the overall size of the Grain. It works independently of the Scale parameters allowing you to upscale and downscale the fractal output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the 3 axes.

## Grain Scale

This parameter controls the overall scale of the individual patches that the fractals create.

## Grain Scale Multiplier

This parameter defines the size of the multiple patches of different fractals that can be combined (each patch being controlled by the Grain Scale parameter). This parameter gives better results when the value is at least double the value of the Grain Scale.

## Complexity

This parameter controls the complexity of the Grain and the underlying fractals. Higher values result in more noise and often somewhat slower renders.

## Exclude Details

This parameter allows you to shave off excess fine details you may not need. For example, distant objects that do not require additional details can have a high Exclude Details value to boost render performance.

## Grain Curve

This parameter controls the naturalized curving of the Grain to simulate realistic flows and scrapes that occur in nature. The Color Map will flow into these shapes.

## Grain Softness

This parameter allows you to add large scale soft patches where the Grain is smoothed out to create realistic terracing with open flat patches. The value of this parameter defines both the size and occurrence of such patches.

## **RENDER SPEED ENHANCEMENT**

### **Suppress Details**

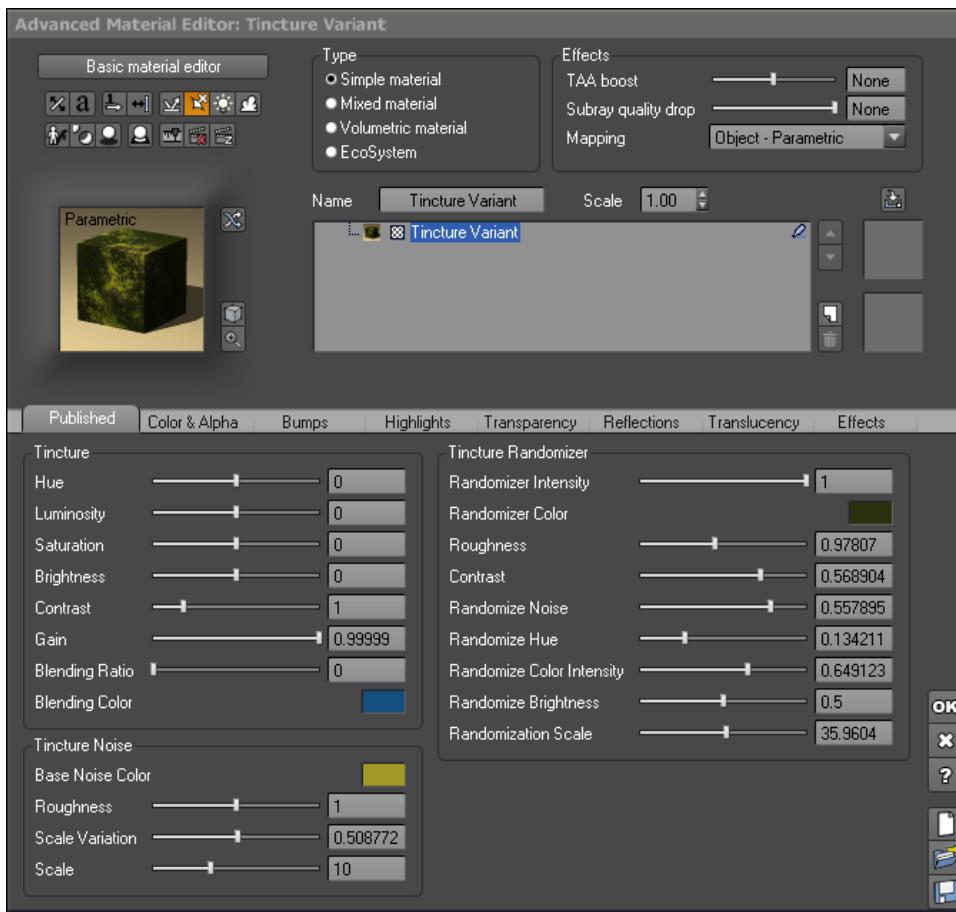
Increasing this parameter suppresses the finer details produced by this node. You should use this feature especially when animating to avoid flicker or noise patches. In most cases, even a modest amount of this parameter can help speed up the render.

## **TWEAKS**

### **Color Distribution Bias**

This special filter allows you to bias the Color Map across the input fractal or other pattern. This is especially helpful when you want to shift the flow of color across the fractal with precision while avoiding the need to alter the Color Map.

# Variant



The most complex color production MetaNode in the Tincture component, **Variant** allows for realistic color production by mixing 4 different levels of noise for a visually sophisticated output. The major significance of this MetaNode is the ability to create large scale patterns with not only shapes, but also with corresponding colors. This is the only MetaNode in the Tincture component that does not rely on a Color Map; instead it creates multiple colors based on 2 simple color choices.

## TINCTURE

### Hue / Saturation / Luminosity

These controls provide familiar color correction methods found in all paint programs. However, please note that the range of these sliders will go far beyond commonly found HSL controls. The expanded range is provided for detailed control over the colors. It is recommended that you use small increments until you are familiar with the intensity of the changes.

## Brightness and Contrast

Like HSL, these controls provide common color correction parameters. Just like the other sliders, the range of Brightness and Contrast is also expanded. Use very small increments to get the desired effect.

### Gain

Apart from Brightness, Contrast, and Luminosity, the Gain parameter provides additional control over color intensity by tweaking the overall gain of the Color Map.

## Blending Color and Ratio

By selecting a Blending Color, the color output can be blended with a single color to achieve uniformity. The Blending Ratio parameter can be used to control the ratio between the Blending Color and the original color output.

## TINCTURE NOISE

### Noise Intensity

This parameter controls the intensity with which the original Color Map is infused with the Tincture Noise parameters.

### Noise Blend Mode

Consisting of the standard blending modes such as Blend, Add, Subtract, Min, Max, Multiply, and Divide; the Noise Blend Mode parameter lets you define exactly how the colors of the noise production are mixed with the Color Map.

### Base Noise Color

The Base Noise Color parameter defines the basic seed from which the rest of the colors are produced in the noise output.

### Roughness

This parameter controls the intensity with which finer details and general complexity in the noise are produced. High values may create too much noise.

### Scale Variation

This parameter controls the general size of the noise's variation. It takes the Scale parameter's values and creates larger cluster variations based on value.

### Scale

This parameter controls the individual size of the noise-producing clusters. The value may need to be altered depending on the size of the object hosting the material.

## TINCTURE RANDOMIZER

### Randomizer Intensity

This parameter controls how intensely the Randomizer noise is mixed with the basic single color noise.

### Randomizer Color

This is the base color the Randomizer will use as the seed. The color specified here is the starting point for all colors produced in the Randomizer.

### Roughness

This parameter controls the intensity with which finer details and general complexity in the noise are produced. High values may create too much noise. The value here will multiply the Roughness of the Tincture Noise properties group above by a factor of 0.45 or 45%.

### Contrast

This parameter controls the maximum contrast between the Randomizer Color and the most contrasting color produced for the entire noise. It will remain independent from the Base Noise Color value.

### Randomize Noise / Hue / Color Intensity / Brightness

These parameters control the maximum amount of randomization each of the properties undergoes. Lower values cause less randomization while higher values cause broader randomization. Excessively high values may cause color artifacts, so use caution.

### Randomization Scale

This parameter controls the size of the largest random patch produced from the parameters above. However, it works independently of the Tincture Noise Scale and Variation.

# LightBender

## **MetaNode Type**

Edge Constraint / Relative Incidence Production

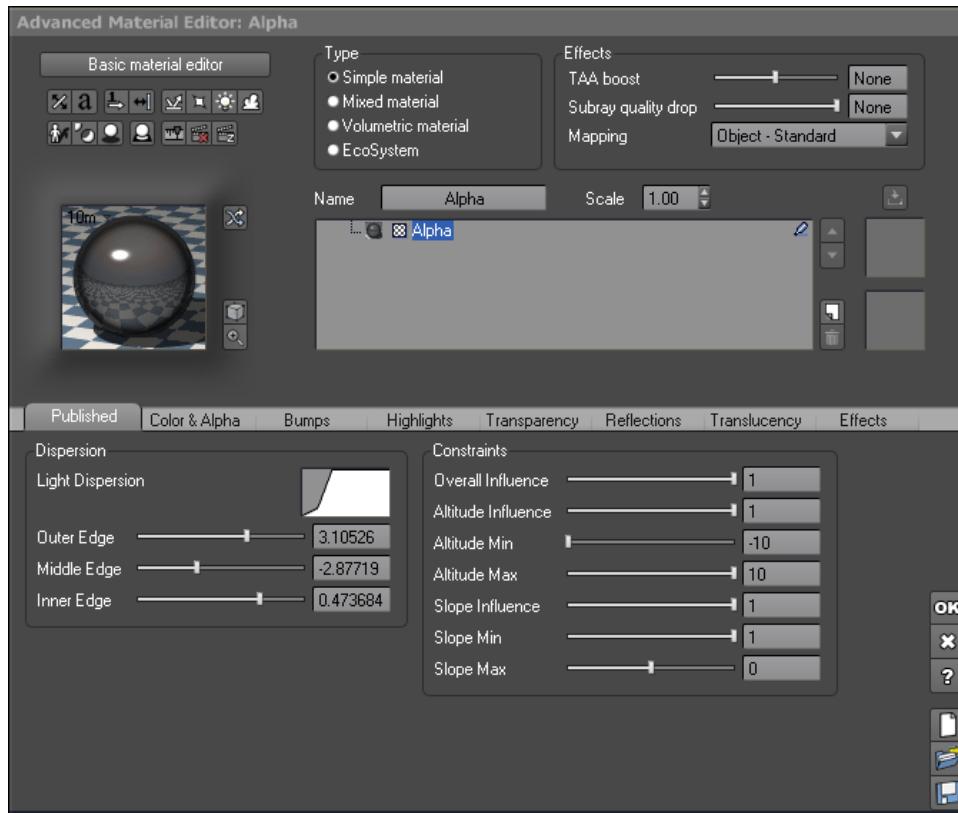
## **Output Type**

Number / Double

## **Input Type**

Self-Contained / Vector

# Alpha



The LightBender **Alpha** MetaNode is an edge constraint and relative incidence node. In other words, it controls how Light, Color, or any other Number based property is controlled from the outer edge of an object to the center. All LightBender nodes are designed to work with the following Output Nodes/Channels in the Function Editor: Color, Highlights, Reflectivity, Transparency, Diffuse, Luminous, Backlight, etc. For color changes, the best method is using Diffuse and/or Luminous channels to alter the color.

## DISPERSION

### Light Dispersion

This parameter is the heart of LightBender. The filter here controls how much light is dispersed from the edge (far right) to the center (far left).

### Outer / Middle / Inner Edge

These Parabolic style parameters control the edges between the main central reflection (the hallmark of Alpha) and the far edges. High values create intense reflection, while lower values create less reflection as well as softness in the edges.

## CONSTRAINTS

### Overall Influence

This parameter controls the influence the Constraints put on the main Light Dispersion. A 0.0 value removes all influence, while a 1.0 value completely influences the material by overriding the Edge constraints of the Dispersion group. This parameter controls the overall inclusion of the Altitude and Slope Influence parameters below.

### Altitude Influence

This parameter decides the influence the Altitude constraints add to the overall effect.

### Altitude Min / Max

In relative units, just like Material Layers or EcoSystems, these parameters control the Minimum and Maximum altitude where Light Dispersion is allowed.

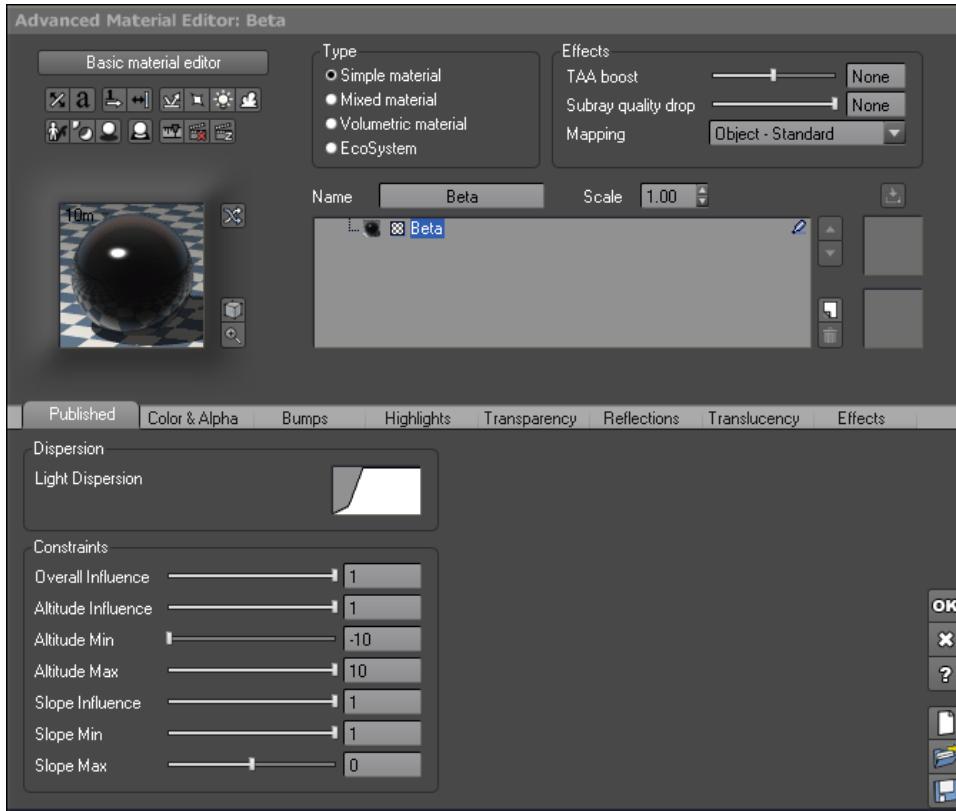
### Slope Influence

This parameter decides the influence the Slope constraints add to the overall effect.

### Slope Min / Max

In relative units, just like Material Layers or EcoSystems, these parameters control the Minimum and Maximum slope where Light Dispersion is allowed.

# Beta



This is the simplest MetaNode in the LightBender component. As a result, Beta is the most efficient to render and can even be applied to large scale distributions, such as a coral reef EcoSystem.

## DISPERSION

### Light Dispersion

This filter controls how much light is dispersed from the edge (far right) to the center (far left). Unlike Alpha where the center of the object always has higher values, Beta is 'untouched' and the Light Dispersion filter gives you complete control over the distribution of high and low values.

## CONSTRAINTS

### Overall Influence

This parameter controls the influence the Constraints put on the main Light Dispersion. A 0.0 value removes all influence, while a 1.0 value completely influences the material by overriding the Edge constraints of the Dispersion group. This parameter controls the overall inclusion of the Altitude and Slope Influence parameters below.

### **Altitude Influence**

This parameter decides the influence the Altitude constraints add to the overall effect.

### **Altitude Min / Max**

In relative units, just like Material Layers or EcoSystems, these parameters control the Minimum and Maximum altitude where Light Dispersion is allowed.

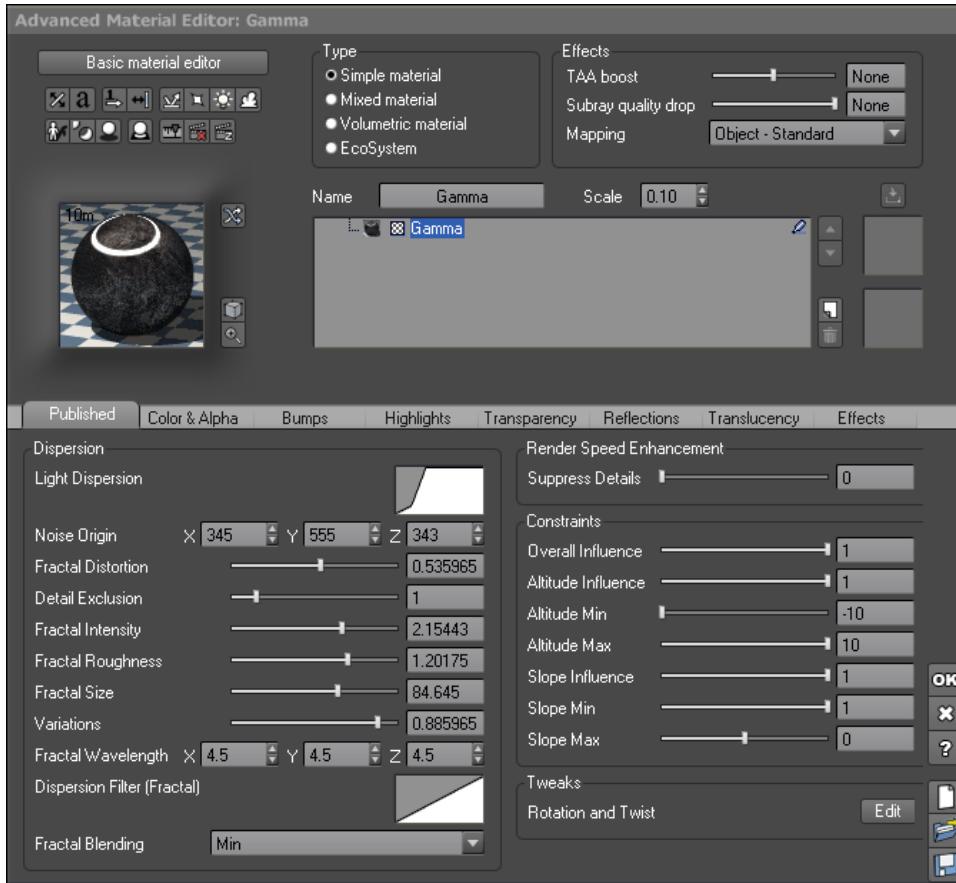
### **Slope Influence**

This parameter decides the influence the Slope constraints add to the overall effect.

### **Slope Min / Max**

In relative units, just like Material Layers or EcoSystems, these parameters control the Minimum and Maximum slope where Light Dispersion is allowed.

# Gamma



**Gamma** is the most sophisticated LightBender MetaNode. It distributes Light Dispersion across a fractal, giving it a realistic yet strange, and almost other-worldly effect. This can be used to simulate distress patterns ranging from crumpled metal to solidified lava flows.

## DISPERSION

### Light Dispersion

This filter controls how much light is dispersed from the edge (far right) to the center (far left). Unlike Alpha where the center of the object always has higher values, Gamma is 'untouched' and the Light Dispersion filter gives you complete control over the distribution of high and low values.

### Noise Origin

This parameter controls the origin of the fractal noise that creates the distribution pattern. By changing the values of these axes, you can 'move around' on the fractal map to find new shapes.

## **Fractal Distortion**

The amount of distortion and warping of the overall fractal output is defined by this parameter.

## **Detail Exclusion**

This parameter allows you to shave off excess fine details you may not need. For example, distant objects that do not require additional details can have a high Exclude Details value to boost render performance.

## **Fractal Intensity**

This is the intensity with which the fractal is imbued into the general Light Dispersion.

## **Fractal Roughness**

This parameter controls the intensity with which finer details and general complexity in the noise are produced. High values may create too much noise.

## **Fractal Size**

This controls the scale of each individual feature or shape created by the fractal.

## **Variations**

This parameter controls the size of the largest random smooth patch produced in the fractal.

## **Fractal Wavelength**

The Wavelength is the main parameter that controls the overall size of the fractal. It works independently of the Scale parameters allowing you to upscale and downscale the fractal output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the 3 axes.

## **Dispersion Filter (Fractal)**

This filter allows you to shape the side/profile of the fractal where the dispersion mainly takes place.

## **Fractal Blending**

Consisting of the standard blending modes such as Blend, Add, Subtract, Min, Max, Multiply, and Divide; the Fractal Blending parameter lets you define exactly how the fractal shapes are mixed with the overall Light Dispersion. By default, the Min value is selected for the crumpled metal look.

## RENDER SPEED ENHANCEMENTS

### **Suppress Details**

This parameter allows for suppressing minor detail to boost the render speed. While it can go from 0.0 (complete detail) to 10.0 (most fine and medium level detail removed), it can take any arbitrary value.

## CONSTRAINTS

### **Overall Influence**

This parameter controls the influence the Constraints put on the main Light Dispersion. A 0.0 value removes all influence, while a 1.0 value completely influences the material by overriding the Edge constraints of the Dispersion group. This parameter controls the overall inclusion of the Altitude and Slope Influence parameters below.

### **Altitude Influence**

This parameter decides the influence the Altitude constraints add to the overall effect.

### **Altitude Min / Max**

In relative units, just like Material Layers or EcoSystems, these parameters control the Minimum and Maximum altitude where Light Dispersion is allowed.

### **Slope Influence**

This parameter decides the influence the Slope constraints add to the overall effect.

### **Slope Min / Max**

In relative units, just like Material Layers or EcoSystems, these parameters control the Minimum and Maximum slope where Light Dispersion is allowed.

# Supernoi

## **MetaNode Type**

Displacement Production

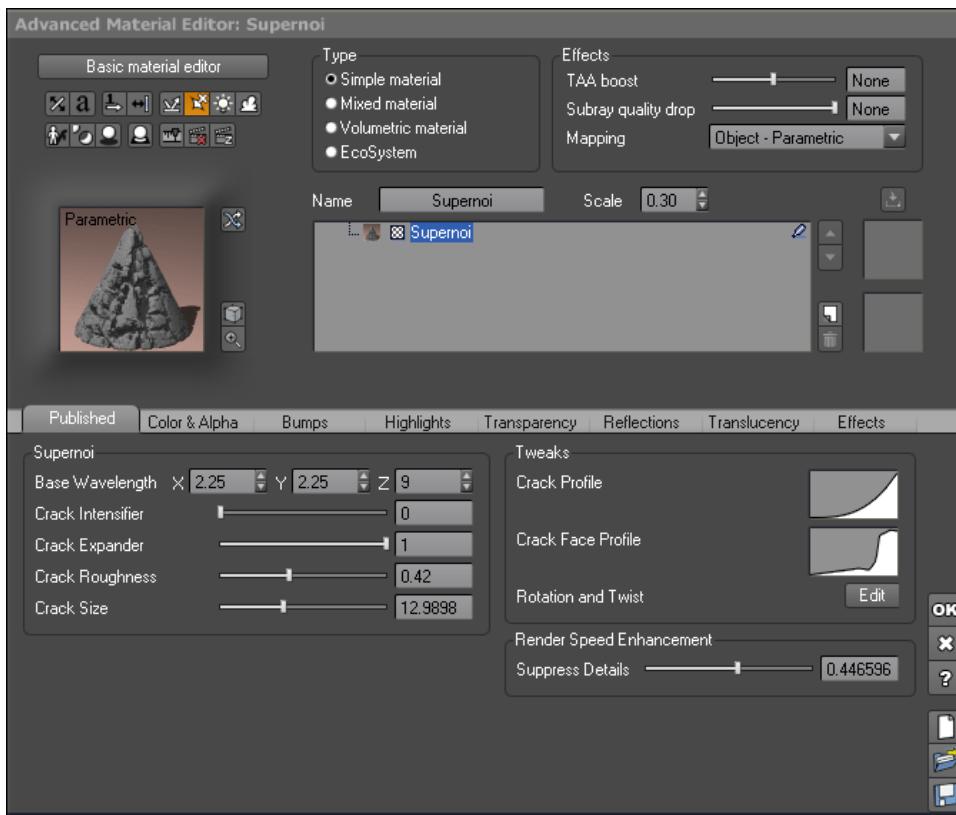
## **Output Type**

Number / Double

## **Input Type**

Vector

# Supernoi



**Supernoi** is a very advanced Displacement and pattern creation MetaNode. It is comprised of fractals using the basic Voronoi structure – one of the most common breakage patterns found in nature – but refined through several different processes to produce realistic rock features. This MetaNode can be applied to textures (bump), HyperTerrains (displacement), and even Procedural Terrains (altitude).

## SUPERNOI

### Base Wavelength

The Wavelength is the main parameter that controls the overall size of the fractal. It works independently of the Scale parameters allowing you to upscale and downscale the fractal output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the 3 axes.

As with other wavelength options across the MDK, if you are using the material on tall objects and the shapes appear stretched on the Z axis, you can compress the Z axis by using a number smaller than the value used in the X and Y axes.

## Crack Intensifier

This parameter allows for the cracks to intensify causing broader breakage and finer peripheral cracks to be born.

## Crack Expander

This parameter takes the cracking further by expanding the ‘valleys’ created by the cracks.

### NOTE

Crack Intensifier and Crack Expander work similarly and on some of the same features. When used in combination with a delicate touch, they can provide a great level of control over the details. As with all parameters, try small changes to observe how they interact with each other.

## Crack Roughness

This parameter determines the intensity with which the basic cracks (low values) are further intensified by creating further cracking (high values) along the course of each basic crack, as well as corresponding sides.

## Crack Size

This parameter controls the size of the largest crack that occurs in the entire fractal. For overall sizing, changing the Wavelength is recommended.

## TWEAKS

### Crack Profile

This filter controls the shape of the cracks in Supernoi. By default, they are configured to be steep. For flatter results, you may make the filter more even.

### Crack Face Profile

While the Crack Profile allows you to shape the side of the cracks, the Crack Face Profile allows you to shape the plateaus produced by the Supernoi fractals. The far right side controls the top flat face.

### Rotation and Twist

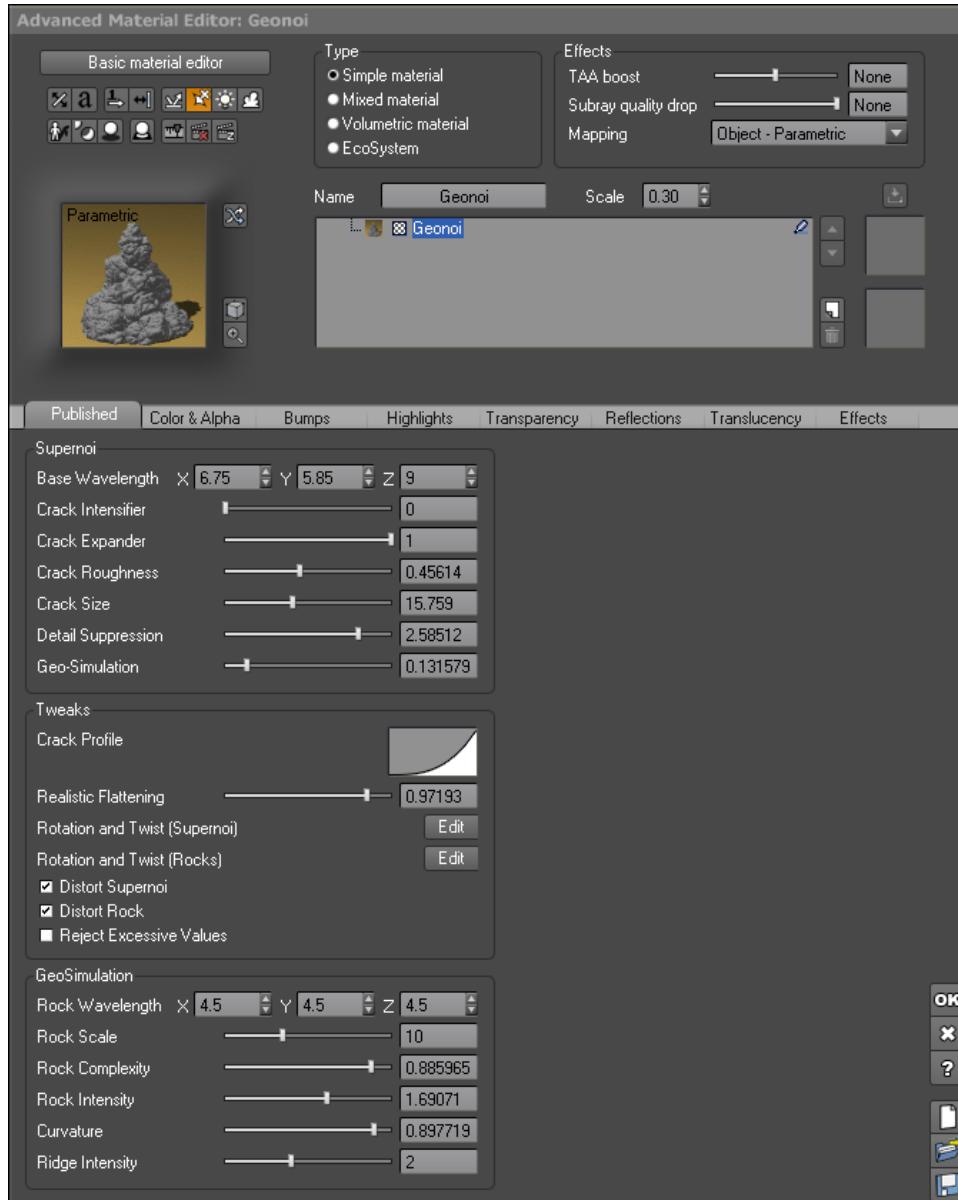
This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode’s output. This will remain independent of the material’s own Rotation and Twist found in the Effects tab.

## RENDER SPEED ENHANCEMENT

### SUPPRESS DETAILS

This parameter works just like Render Boost which allows you to sacrifice smaller details for faster overall render speed.

# Geonoi



Geonoi expands on the classic Supernoii MetaNode by adding an overlay of generic geological simulation on the fractal production. Geonoi allows independent modification of the Supernoii and GeoSimulation parts of the MetaNode.

## SUPERNOI

### Base Wavelength

The Wavelength is the main parameter that controls the overall size of the fractal. It works independently of the Scale parameters allowing you to upscale and downscale the fractal

output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the 3 axes.

As with other wavelength options across the MDK, if you are using the material on tall objects and the shapes appear stretched on the Z axis, you can compress the Z axis by using a number smaller than the value used in the X and Y axes.

### Crack Intensifier

This parameter allows for the cracks to intensify causing broader breakage and finer peripheral cracks to be born.

### Crack Expander

This parameter takes the cracking further by expanding the ‘valleys’ created by the cracks.

#### NOTE

Crack Intensifier and Crack Expander work similarly and on some of the same features. When used in combination with a delicate touch, they can provide a great level of control over the details. As with all parameters, try small changes to observe how they interact with each other.

### Crack Roughness

This parameter determines the intensity with which the basic cracks (low values) are further intensified by creating further cracking (high values) along the course of each basic crack, as well as corresponding sides.

### Crack Size

This parameter controls the size of the largest crack that occurs in the entire fractal. For overall sizing, changing the Wavelength is recommended.

### Detail Suppression

This parameter is not a Render Speed Enhancement that is found in other MetaNodes. A Render Speed Enhancement will remove small details while retaining the overall essence of the shapes. This Detail Suppression parameter will, at higher values, remove entire shapes. It should be used with caution.

The default value of 2.58 has been set to allow for adequate render speed. Lower values may cause unnecessary shapes to be introduced which may slow down your renders considerably.

### Geo-Simulation

This parameter controls how much GeoSimulation is added to the Supernoi production. Unlike a normal blending process, at the maximum value of 1.0 (100%), GeoSimulation is still added on top of Supernoi and does not take away the main Supernoi fractal production.

## TWEAKS

### Crack Profile

This filter controls the shape of the cracks in Supernois. By default, they are configured to be steep. For flatter results, you may make the filter more even.

### Realistic Flattening

This parameter intelligently calculates specific low-convection areas of the rock formation, and flattens them as they would in real life when facing geological forces from multiple sides.

### Rotation and Twist (Supernois) / (Rocks)

This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode's output. This will remain independent of the material's own Rotation and Twist found in the Effects tab.

The 2 independent Rotation and Twist controls for Supernois and Rocks allow you to modify both visual features separately. This can help you create precise geological rock formations.

### Distort Supernois

Enable this option to use intelligent Supernois distortion which randomizes several shapes and shape origins for the Supernois fractal, while retaining the original essence of the shapes.

### Distort Rock

Similar to Distort Supernois, this parameter lets you distort the GeoSimulation features that produce protruding rocks in the MetaNode's output.

### Reject Excessive Values

This tweak parameter allows you to discard minor excess values in the fractal which can sometimes cause false protrusions or bad triangular peaks.

## GEOSIMULATION

### Rock Wavelength

The Wavelength is the main parameter that controls the overall size of the fractal. It works independently of the Scale parameters allowing you to upscale and downscale the fractal output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the three axes.

As with other wavelength options across the MDK, if you are using the material on tall object and the shapes appear stretched on the Z axis, you can compress the Z axis by using a number smaller than the value used in the X and Y axes.

### **Rock Scale**

This parameter determines the biggest rock formation that can occur in the GeoSimulation overlay.

### **Rock Complexity**

This parameter controls the complexity of small rock formations that occur in the GeoSimulation overlay.

### **Rock Intensity**

This parameter controls the intensity with which the GeoSimulation overlay is merged with the Supernoi production. Higher values create more pronounced rock formation inclusions.

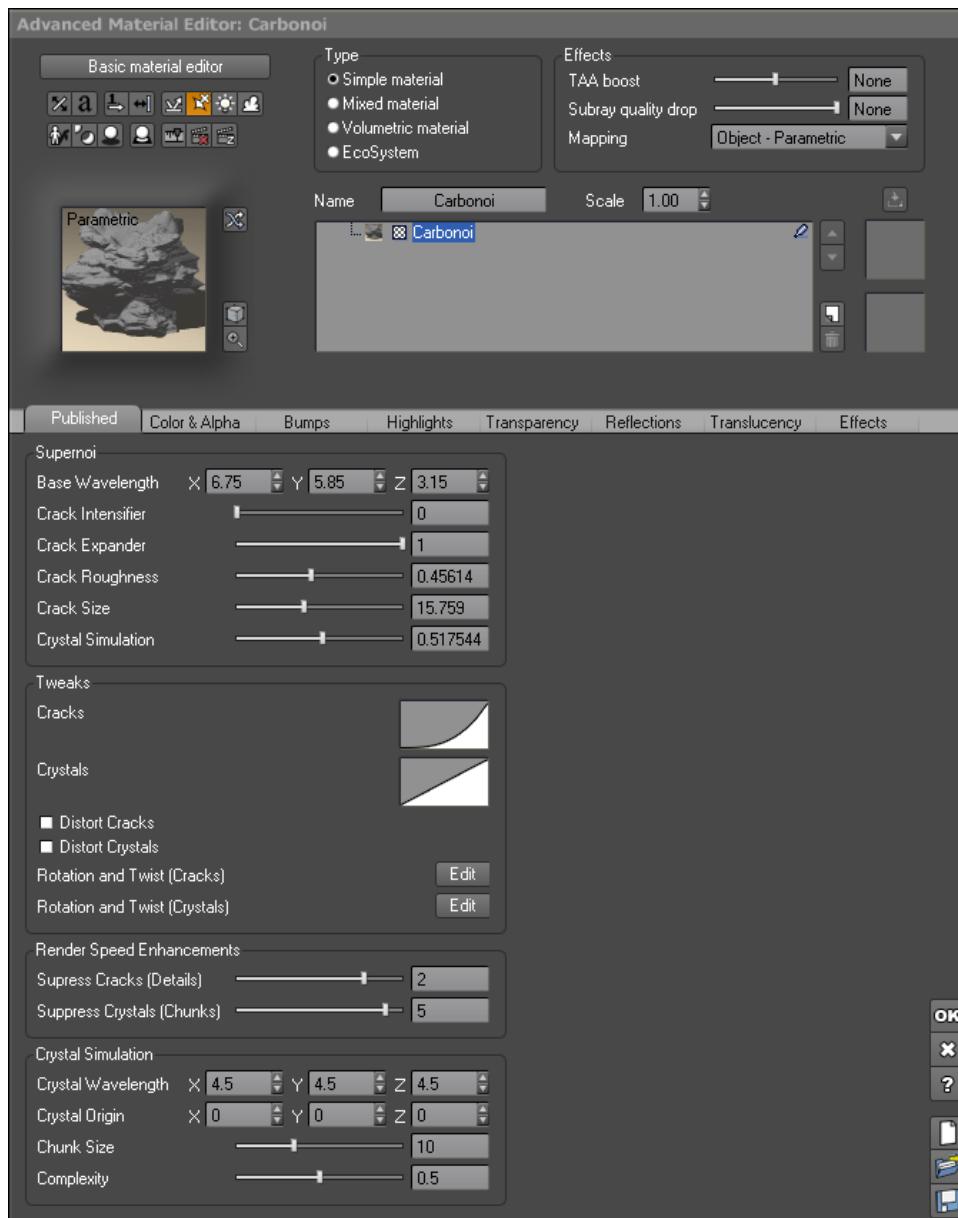
### **Curvature**

This parameter controls how much curving and warping can occur in the GeoSimulation shapes.

### **Ridge Intensity**

This parameter controls the height of the major ridges produced in the GeoSimulation.

# Carbonoi



Carbonoi behaves similarly to Geonoi; however, the generic geological simulation is replaced with crystalline simulation. This produces the crystalline structures of sandstone, marble, and other crystal-based geological components - not sharp, refined crystals.

## SUPERNOI

### Base Wavelength

The Wavelength is the main parameter that controls the overall size of the fractal. It works independently of the Scale parameters allowing you to upscale and downscale the fractal

output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the 3 axes.

As with other wavelength options across the MDK, if you are using the material on tall objects and the shapes appear stretched on the Z axis, you can compress the Z axis by using a number smaller than the value used in the X and Y axes.

### Crack Intensifier

This parameter allows for the cracks to intensify causing broader breakage and finer peripheral cracks to be born.

### Crack Expander

This parameter takes the cracking further by expanding the ‘valleys’ created by the cracks.

#### NOTE

Crack Intensifier and Crack Expander work similarly and on some of the same features. When used in combination with a delicate touch, they can provide a great level of control over the details. As with all parameters, try small changes to observe how they interact with each other.

### Crack Roughness

This parameter determines the intensity with which the basic cracks (low values) are further intensified by creating further cracking (high values) along the course of each basic crack, as well as corresponding sides.

### Crack Size

This parameter controls the size of the largest crack that occurs in the entire fractal. For overall sizing, changing the Wavelength is recommended.

### Crystal Simulation

This parameter controls how much Crystal Simulation is added to the Supernoi production. Unlike a normal blending process, at the maximum value of 1.0 (100%), Crystal Simulation is still added on top of Supernoi and does not take away the main Supernoi fractal production.

## TWEAKS

### Cracks + Crystals

These filters allow you to edit the shape output of the Cracks and Crystals features independently of every other parameter. This is very useful for tweaking the shape or removing unnecessary protrusions.

### Distort Supernoi

Enable this option to use intelligent Supernoi distortion which randomizes several shapes and shape origins for the Supernoi fractal, while retaining the original essence of the shapes.

## **Distort Crystals**

Similar to Distort Supernois, this parameter lets you distort the Crystal Simulation features that produce protruding crystalline formations in the MetaNode's output.

## **Rotation and Twist (Supernois) / (Crystals)**

This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode's output. This will remain independent of the material's own Rotation and Twist found in the Effects tab.

The 2 independent Rotation and Twist controls for Supernois and Rocks allow you to modify both visual features separately. This can help you create precise geological rock formations.

## **RENDER SPEED ENHANCEMENTS**

### **Suppress Cracks (Details)**

This parameter will suppress cracks starting from the smallest to the medium sized, depending on the value set.

### **Suppress Crystals (Chunks)**

This parameter will remove smaller crystal chunks. It can accept higher values as well, where larger crystal chunks will also be removed. It should be used with caution as excessive values will distort the overall shape of the Crystal Simulation.

## **CRYSTAL SIMULATION**

### **Crystal Wavelength**

The Wavelength is the main parameter that controls the overall size of the crystals infused into the Supernois production. It works independently of the Size parameters allowing you to upscale and downscale the fractal output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the three axes.

### **Crystal Origin**

This parameter determines the location on the 'fractal map' that is used for the Crystal Simulation. Changing these values allows you to move the shapes on your material.

### **Chunk Size / Smallest Chunk Size**

These parameters control the chunk sizes of crystals that can occur in the Crystal Simulation.

### **Complexity**

This parameter controls how complex the substructure of the crystal chunks can be in the Crystal Simulation.

# CrackMaker

## **MetaNode Type**

Bump / Displacement Production

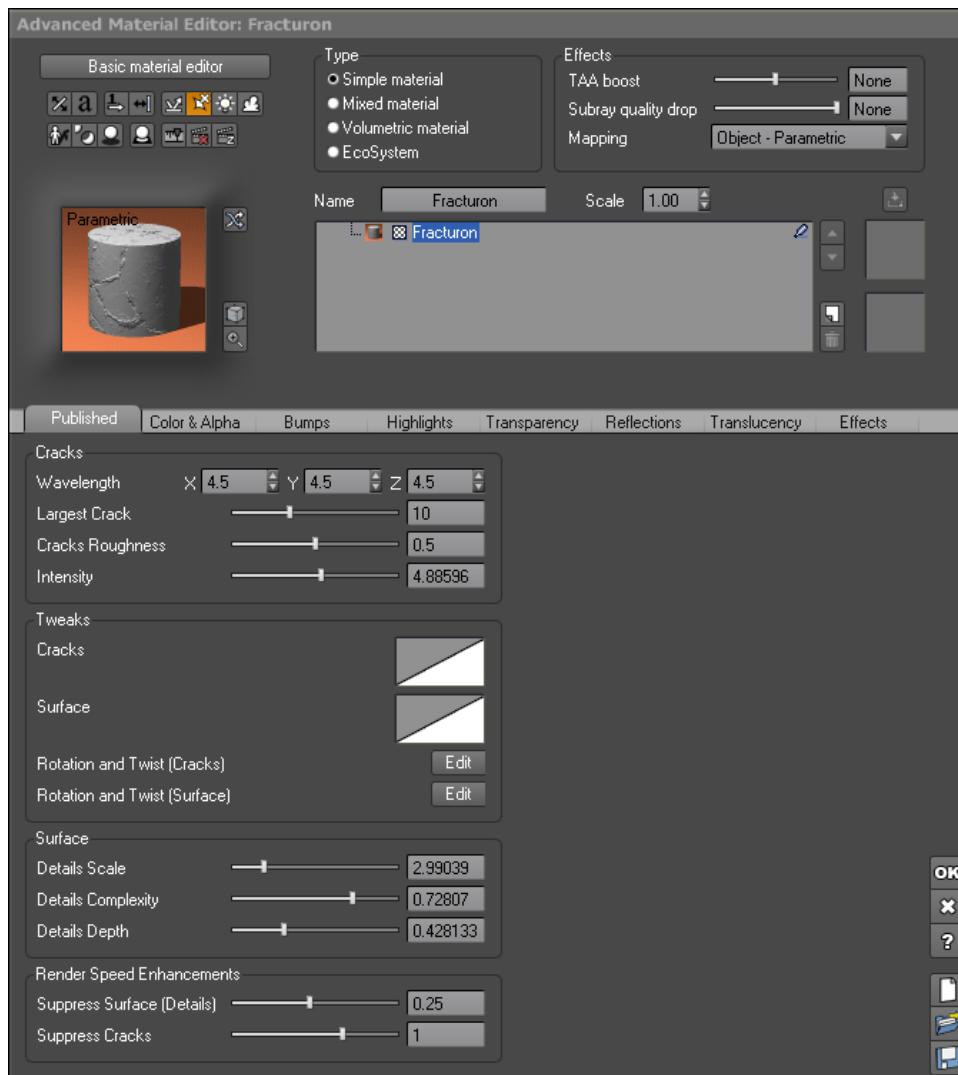
## **Output Type**

Number / Double

## **Input Type**

Self-Contained / Vector

# Fracturon



CrackMaker's basic version is contained in **Fracturon**, which allows you to create realistic large scale cracks that intermingle to produce smaller cracks. This MetaNode is ideal for making delicate and timeworn materials.

## CRACKS

### Wavelength

The Wavelength is the main parameter that controls the overall size of the fractal. It works independently of the Scale parameters allowing you to upscale and downscale the fractal output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the 3 axes.

As with other wavelength options across the MDK, if you are using the material on tall objects and the shapes appear stretched on the Z axis, you can compress the Z axis by using a number smaller than the value used in the X and Y axes.

### Largest Crack

As the name suggests, this parameter controls the largest crack created in the material. By default it is set to 10, but can easily be modified to suit the scale of the target object.

### Cracks Roughness

This parameter generates more surface fractures by adding smaller cracks between the larger cracks. Less roughness yields bigger and more precise cracks, suitable for solid objects that would be difficult to break. High roughness produces multiple cracks, suitable for more delicate objects that would crack profusely.

### Intensity

This is the intensity with which cracks are fashioned. High values form deeper cracks, and low values make simple superficial cracks.

## TWEAKS

### Cracks

This filter allows you to change the profile of the crack's groove as it goes below the surface of the material. This is especially useful when using Displacement.

### Surface

This filter allows you to change the profile of the surface features that appear in flat areas where cracks have not formed.

### Rotation and Twist (Cracks) / (Surface)

This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode's output. This will remain independent of the material's own Rotation and Twist found in the Effects tab.

The 2 independent Rotation and Twist controls for Cracks and Surface allow you to modify both visual features separately. This can help you create precise geological rock formations.

## SURFACE

### Details Scale

This function controls the overall scale of the superficial surface features created in flat areas where cracks have not formed.

### **Details Complexity**

This setting governs the complexity of the shapes that appear on the surface. Increased complexity gives finer details. If you wish to remove the surface details and achieve a completely smooth look for the unbroken portions of the surface, you can set this parameter to 0.0.

### **Details Depth**

This parameter directs the depth (or height, in other words) of the surface features. If you wish to remove the surface details and achieve a completely smooth look for the unbroken portions of the surface, you can set this parameter to 0.0.

## **RENDER SPEED ENHANCEMENTS**

### **Suppress Surface (Details)**

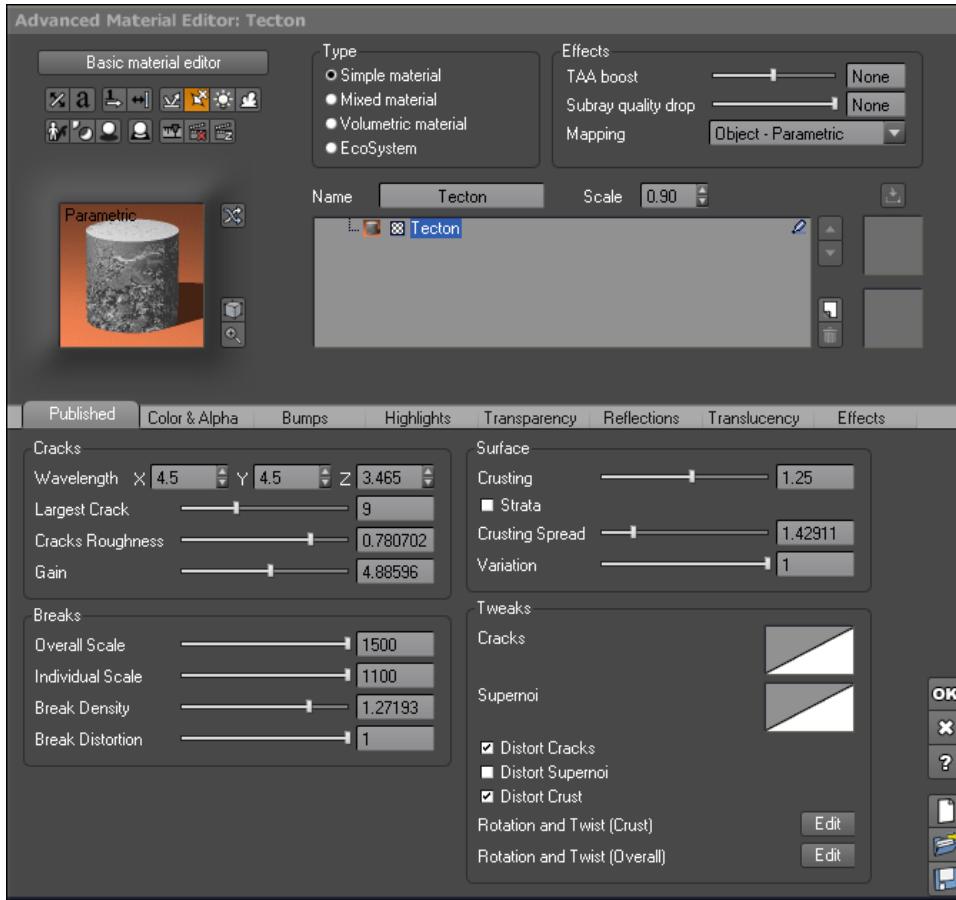
This setting will suppress finer details in the surface areas to achieve faster renders and decrease flickering in animations.

### **Suppress Cracks**

This parameter will suppress the smaller cracks to boost animation fidelity and render speed.

If you want numerous cracks, but not small ones, you can increase both the Crack Roughness and Suppress Cracks. This combination will ensure that the quantity of cracks multiplies, while the size of the cracks remains in control.

# Tecton



Tecton builds on Fracturon by adding large scale breakage and optional stratification to the surface. This makes it ideal for aged elements, i.e. natural rock formations or ancient manmade ruins. Like with Fracturon, the cracks are exposed separately so you can color both the cracks and the peeling surface independently. All intense breakage in this MetaNode is powered by a special imbedded version of Superno.

## CRACKS

### Wavelength

The Wavelength is the main parameter that controls the overall size of the fractal. It works independently of the Scale parameters allowing you to upscale and downscale the fractal output size without altering the shape of the fractal. The Wavelength also allows you to independently change the scales of the 3 axes.

As with other wavelength options across the MDK, if you are using the material on tall objects and the shapes appear stretched on the Z axis, you can compress the Z axis by using a number smaller than the value used in the X and Y axes.

To achieve the default style of Tecton, the Z axis has been compressed by almost 1.1 units (approx. 25%). This ratio should be kept intact when adjusting the wavelength.

### Largest Crack

As the name suggests, this parameter controls the largest crack created in the material. By default it is set to 10, but can easily be modified to suit the scale of the target object.

### Cracks Roughness

This parameter generates more surface fractures by adding smaller cracks between the larger cracks. Less roughness yields bigger and more precise cracks, suitable for solid objects that would be difficult to break. High roughness produces multiple cracks, suitable for more delicate objects that would crack profusely.

### Gain

This is the intensity with which cracks are fashioned. High values form deeper cracks, and low values make simple superficial cracks.

## BREAKS

### Overall Scale

This parameter determines the overall size of the large breakage areas. Changing this value can have a drastic impact on the materials and should be implemented with caution, and in small increments.

### Individual Scale

This setting governs the size of the common individual breaks that make up the larger breakage areas. Individual Scale should be kept in mind when changing Overall Scale as both controls are very closely intermingled in the production of the fractal output.

### Break Density

This is the overall density of breaks found on the surface. Low values yield fewer and larger breaks, and high values generate complex and denser breaks.

### Breaks Distortion

This parameter is provided to avoid a uniform breaking pattern. By increasing the Breaks Distortion, the shapes of the breakage can be warped.

## SURFACE

### Crusting

This parameter regulates how much of the unbroken crust is present.

## **Strata**

This checkbox enables grand horizontal strata to portray horizontal breakage and collapses.

It is a simple Boolean option that can be turned on or off. The interim configuration is automatically computed based on the Breaks and Surface group values.

## **Crusting Spread**

This parameter determines how far the crusting spreads over unbroken surfaces.

## **Variation**

This setting controls smart shape-changes, randomly calculated over the entire surface, to create believable variations while maintaining the overall essence of the shape.

## **TWEAKS**

### **Cracks**

This filter allows you to change the profile of the crack's groove as it goes below the surface of the material. This is especially useful when using Displacement.

### **Supernoi**

This filter controls the shape of the cracks in Supernoi. By default, they are configured to be flat, but you can make the filter steeper for a more pronounced effect.

### **Distort Cracks / Supernoi / Crust**

Enable these options to use intelligent distortion, which randomizes several shapes and shape origins for the Cracks, Supernoi, and Crust fractal outputs.

### **Rotation and Twist (Crust) / (Overall)**

This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode's output. This will remain independent of the material's own Rotation and Twist found in the Effects tab.

The 2 independent Rotation and Twist controls for the crust and overall breakage allow you to modify both visual features separately. This can help you create precise geological rock formations.

# RockBreaker

## **MetaNode Type**

Bump / Displacement Production

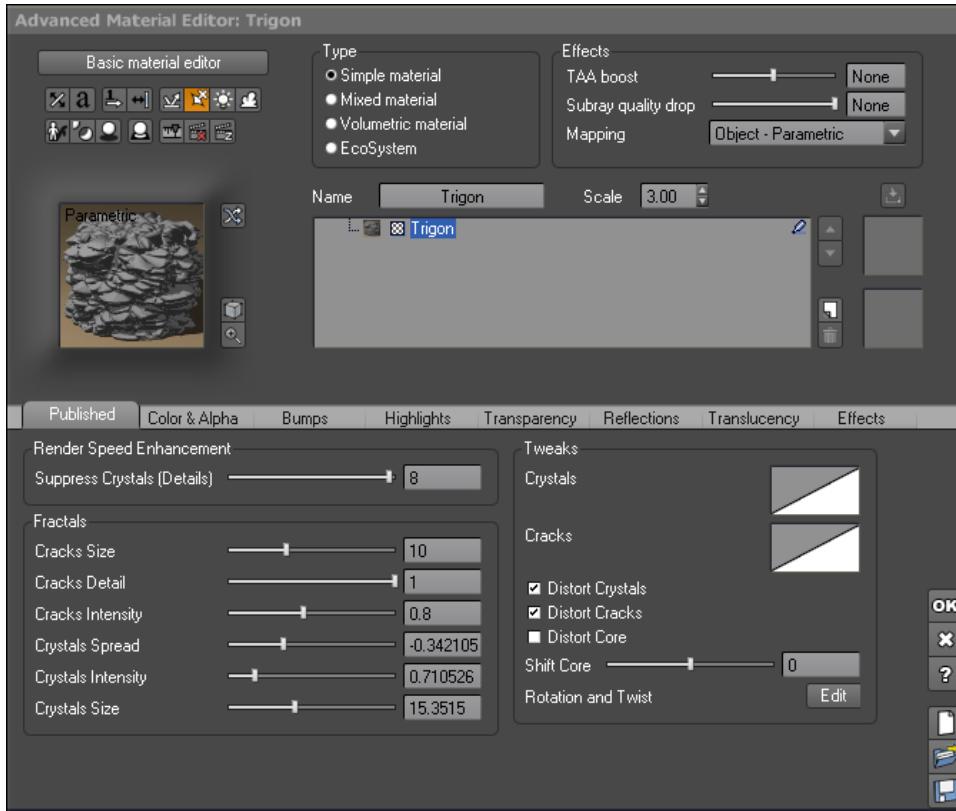
## **Output Type**

Number / Double

## **Input Type**

Self-Contained / Vector

# Trigon



The **Trigon** MetaNode is an ideal way to create large crystal-like rock formations. This MetaNode can be combined with other fractals or RockBreaker MetaNodes to create broader displacement, with Trigon serving as the base on which the other fractals add their details.

## RENDER SPEED ENHANCEMENTS

### Suppress Crystal (Details)

This setting will suppress finer details in the crystalline structure to achieve faster renders and decrease flickering in animations.

## FRACTALS

### NOTE

The following settings may be dramatically affected by the value of Shift Core setting.

### Cracks Size

This parameter controls the size of the cracks between the crystal shards. Increasing the value can create larger flat areas between crystals.

### Cracks Detail

This parameter controls the details inside the cracks and sub-cracks connected to the primary cracks. Lowering this value can create smoother shapes in certain instances.

### Cracks Intensity

This parameter controls the intensity with which grooves of the cracks penetrate the crystal-infused surface.

### Crystals Spread

This parameter controls how the crystals spread on the surface. This value may be affected when you alter the Crystals filter.

### Crystals Intensity

This parameter controls how far the crystal spikes protrude. Extremely high values may cause tears in the mesh, so use sparingly.

### Crystals Size

This parameter controls the overall size of the crystal chunks.

## TWEAKS

### Crystals

This filter allows you to change the profile of the crystals and how they protrude from the surface of the material. This is especially useful when using Displacement.

### Cracks

This filter allows you to change the profile of the crack's groove as it goes below the surface of the material.

### Distort Crystals / Cracks / Core

Enable this option to use intelligent distortion, which randomizes several shapes and shape origins for the Crystals, Cracks, and underlying Core fractal outputs.

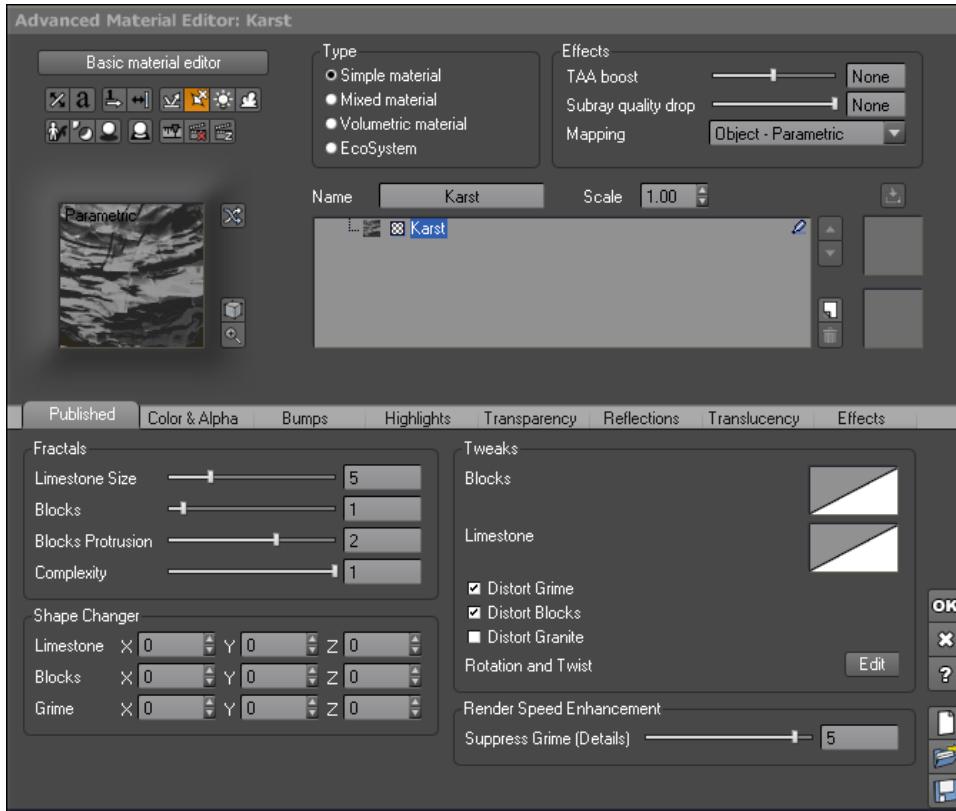
### Shift Core

This parameter 'pushes in' or 'pulls out' the core of the crystal mathematics. The neutral value of 0.0 nulls the effect, but positive and negative values will cause the crystals to shift considerably. Experiment with this slider along with the Fractals group sliders to achieve finer control over the crystals.

### Rotation and Twist

This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode's output. This will remain independent of the material's own Rotation and Twist found in the Effects tab.

# Karst



**Karst** is a powerful limestone rock formation displacement MetaNode. This Z-axis-heavy displacement component creates layered limestone slabs to simulate realistic rock formations. One of the major features of Karst is the independent Origin control which allows for detailed fine tuning of the different shapes that combine to produce the final output.

## FRACTALS

### Limestone Size

This parameter controls the size of the limestone slabs that protrude from the core shape.

### Blocks

This parameter controls the size of the multiple blocks that add unevenness to the limestone slabs.

In situations where you want a steady increase in the size of the material, you may need to increase this in ratio to the Limestone Size. For example, if Limestone Size is 10, then Blocks should be 2. It is not mandatory, however, and you can use uneven ratios as well.

### Blocks Protrusion

This is the depth of the protrusion of the blocks inside the limestone slabs.

## Complexity

This parameter controls the complexity of both the limestone slabs and the blocks protruding from them.

## SHAPE CHANGER

### Limestone / Blocks / Grime

This axial matrix allows you to shift and change the shape of the 3 components that make up the material. Despite the complex appearance of these controls, the modification of these shapes is quite easy. Simply add or subtract numbers to shift a specific shape along the desired axis.

The numbers are in meters, depending on your Vue defaults it may change to that unit.

## TWEAKS

### Blocks

This filter allows you to change the profile of the blocks and how they protrude from the surface of the limestone slabs. This is especially useful when using Displacement.

### Limestone

This filter allows you to change the shape of the limestone slabs. This is also useful to achieve greater control over the shape when using Displacement.

### Distort Grime / Blocks / Granite

Enable this option to use intelligent distortion, which randomizes several shapes and shape origins for the Grime, Blocks, and Limestone slabs fractal outputs.

#### NOTE

A typographical error lists the Limestone as Granite in this option.

### Rotation and Twist

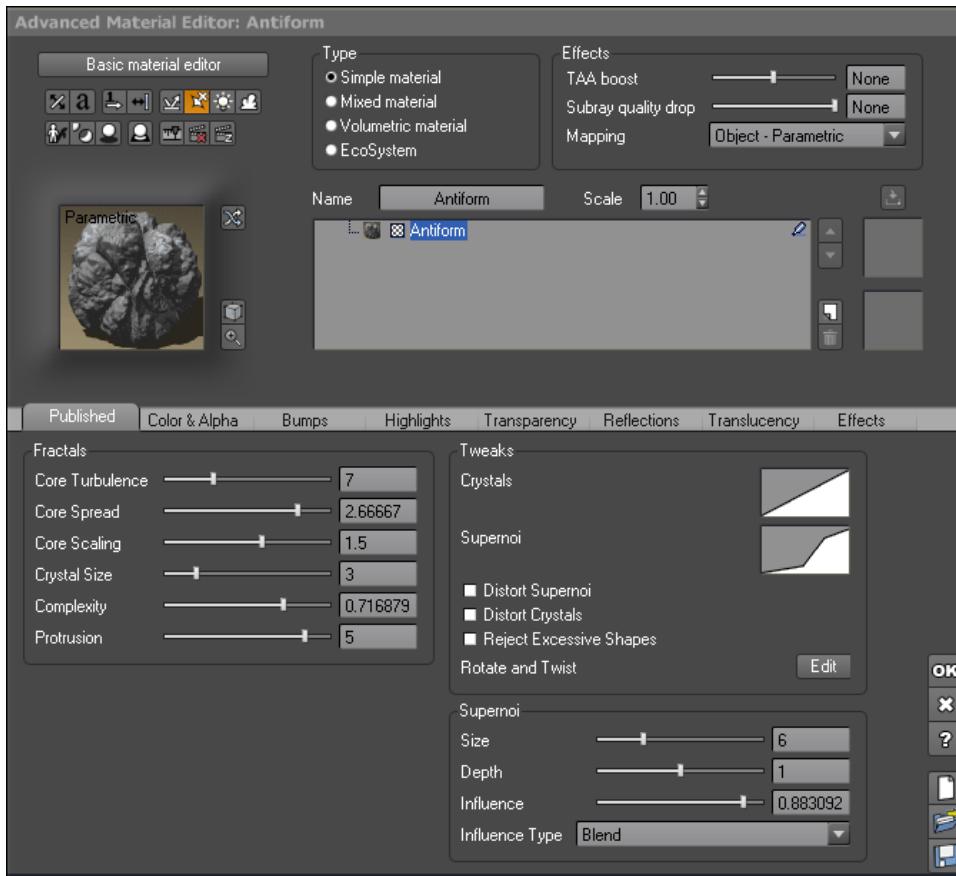
This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode's output. This will remain independent of the material's own Rotation and Twist found in the Effects tab.

## RENDER SPEED ENHANCEMENT

### SUPPRESS GRIME (DETAILS)

This setting will suppress finer details in the grime to achieve faster renders and decrease flickering in animations.

# Antiform



Inspired by vertical sandstone rock formations, Antiform is an elaborate sandstone and generic rock production MetaNode. Antiform uses a modified version of Supernoi to generate the sandstone slab separation. Antiform is crystal-based, capturing the crystalline structure of sandstone; not sharp, refined crystals.

## FRACTALS

### Core Turbulence

This parameter controls the core turbulence which creates the overall distorted shape.

### Core Spread

This parameter controls the range across which the core will spread the distortion.

### Core Scaling

This is the unit-agnostic scaling of the core. It changes the scale of the overall core distortion that produces the main shapes of the fractals.

## Crystal Size

This parameter controls the size of the crystals that make the larger shapes of this material.

## Complexity

This parameter controls the complexity of the crystals and the general core.

## Protrusion

This parameter controls how far the core protrudes.

## TWEAKS

### Crystals

This filter allows you to tweak the core crystal shapes and the profile of the distortion.

### Supernoi

This filter allows you to change the shape of the Supernoi effect.

### Distort Supernoi

Enable this option to use intelligent Supernoi distortion, which randomizes several shapes and shape origins for the fractal output.

### Reject Excessive Shapes

This is a situation-specific tweak where the addition of multiple fractals might create sharp shapes or spikes. When you check this, the MetaNode will remove those excess shapes when possible.

If the excess shapes are not present, this option should be left unchecked; otherwise it may interfere with the normal shapes.

### Rotate and Twist

This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode's output. This will remain independent of the material's own Rotation and Twist found in the Effects tab.

## SUPERNOI

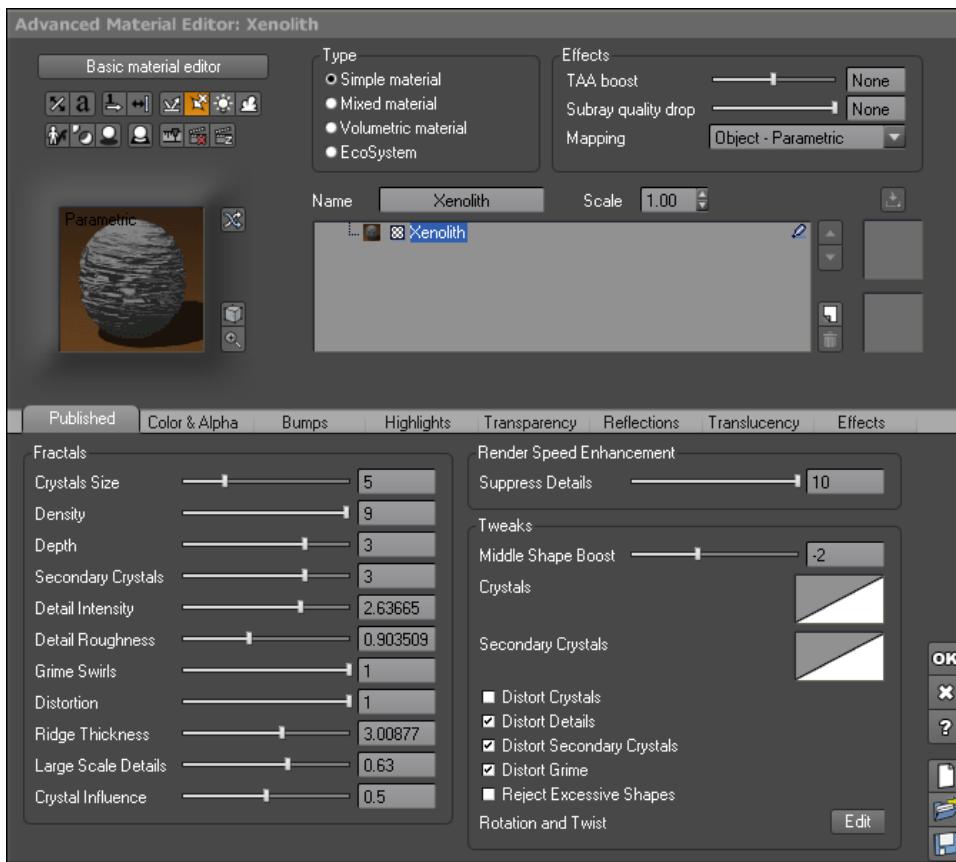
### Size / Depth

These parameters control the size and depth of the Supernoi shapes infused into the core.

### Influence / Influence Type

This Influence parameter controls how much influence the Supernoi shapes have over the core. The Influence Type allows you to select the kind of blending that is used to infuse the core with Supernoi shapes.

# Xenolith



The **Xenolith** MetaNode encapsulates the distinct look of layered strata, deposited over millions of years. The basic structure is crystalline to simulate the nature of sandstone. Applying this MetaNode's displacement to even simple primitives can create remarkable, large-scale rock formations. It can also be combined with other MetaNodes, such as Supernoii and Antiform, for extended effects.

## FRACTALS

### Crystal Size

This parameter controls the size of the sharp, flat crystal beds that create the overall shape.

### Density

This parameter controls the density of the crystal beds and how strongly they are fused together.

### Depth

This parameter controls the protrusion depth of the crystals.

### **Secondary Crystals**

This parameter controls the size and amount of secondary crystals, which follow the principles of the main crystals, but are generated on a different scale and origin for natural randomness.

### **Detail Intensity**

This parameter controls how strongly the details of the overall shape are presented on the surface. This can be lowered whenever your objects are far away, or if you require a lower resolution baking of the displacement.

### **Detail Roughness**

This parameter controls the roughness of the surface details. Higher values may produce excessive noise and can sometimes cause unnecessary spikes.

### **Grime Swirls**

This parameter controls how strongly swirls and natural deposition movement are added to the grime between the crystals. By default, it is set to maximum.

### **Distortion**

This parameter controls distortion of the crystals. Distortion allows the crystals to have a non-uniform shape that mimics nature.

### **Ridge Thickness**

This parameter controls the thickness of ridges formed by large groups of crystals.

### **Large Scale Details**

This parameter controls how much superficial large scale detail is added to the output. This is a secondary detail which will not affect the displacement greatly, but will add quality when used with bump to add more micro detail on the surface.

### **Crystal Influence**

This parameter controls the balance between crystals and grime. It is often a good idea to use slightly different values on each object when you have a cluster of objects using the same material. This will give distinctiveness to each object.

## **RENDER SPEED ENHANCEMENT**

### **SUPPRESS DETAILS**

This parameter, set to 10 by default, suppresses smaller details to improve render speed and decrease flickering in non-baked displacement. It also helps you to avoid bad polygons and spikes when baking the displacement. While appearing to be at maximum with a value of 10, this parameter can accept manual entry of higher values.

Excessive values are not recommended. However, if you enter an exceedingly high value, the MetaNode logic will treat the number as the maximum allowed, helping you avoid bad shapes.

The maximum allowed value is calculated automatically by the different values entered in the Fractals group. The beauty of the MDK is to handle those calculations for you.

## TWEAKS

### Middle Shape Boost

While included under the Tweaks group, this parameter has profound control over the shape output of Xenolith. The middle shape referred to here is the clamped values of 0.33 to 0.68 of the entire fractal core that generates the shape. In other words, it is the middle portion of the height or altitude generated by the fractal.

This slider biases that middle portion of the fractal output. Lower values such as -6.0 can create flatter areas in certain places, while higher values such as +6.0 can cause the crystal beds to protrude more prominently.

### Crystals

This filter allows you to alter the shape profile of the primary crystal beds.

### Secondary Crystals

This filter allows you to alter the shape profile of the secondary crystals found in the grime.

### Distort Crystals / Details / Secondary Crystals / Grime

Enable this option to use intelligent distortion, which randomizes several shapes and shape origins for the fractal output for each of these specific features.

### Reject Excessive Shapes

When using high values that create intense crystal protrusion, this feature can help automatically block excessively intense shapes.

It may need to be used in conjunction with the fine tuning of the Crystals filter and the Middle Shape Boost, depending on what values you have in the Fractals group.

### Rotation and Twist

This parameter allows you to access Rotation and Twist controls for all 3 axes. You can use it to rotate/tilt, or skew the entire MetaNode's output. This will remain independent of the material's own Rotation and Twist found in the Effects tab.

# FAQ / Troubleshooting

## **What should I do if the overall look of the material is off, or does not seem accurate?**

Try changing the Scale of the entire material. If it is 1.0, then try 0.10; or vice versa. Try values in between (or higher) depending on the size of the object.

You can also change the Mapping of the material between “Object – Parametric” and “Object – Standard”. Please see Vue’s manual for details on the mapping modes.

## **The materials are taking too long to render. How can I speed up my render?**

If you are using Displacement, you may want to decrease the quality of the material or bake the object to polygons (Infinite only).

Otherwise you may want to increase the Render Speed Enhancement values, if available, in your MDK nodes. See the corresponding MetaNode’s section in this manual for details on which settings to change.

## **When I apply a displacement material to my primitive objects, the shape is broken near the edges. How can I fix this?**

Try converting your primitive (even if it is an individual) to a MetaBlob. This will soften all the edges and create smoother results.

## **Why is the predefined Scale for some materials not at 1.00?**

Due to engine changes between Vue 8.5 (for which the MDK 1.0 was originally crafted) and higher versions, certain scale discrepancies exist which require slightly different scaling than normal materials.

## **Can I replace my MDK 1.0 nodes with the MDK 1.1 nodes in existing projects?**

No. MDK 1.1 has a different core than MDK 1.0. We recommend using the MDK upgrade on new materials or new projects.

If you are using Vue 8.5, use MDK 1.0. MDK 1.1 is not compatible with Vue 8.5 or older versions.

## **I see flickering in my animations. What should I do?**

The Render Speed Enhancement options are created for this specific reason. If you increase the value of these options, minuscule detail will be suppressed. Such details are the primary reason for noise in bump and displacement.

If you are getting fluctuations in the displacement while animating, you may need to the bake the object to polygons so the structure of the object remains stable during animation.

### **My displacement shapes seem to protrude too far. How can I damp them?**

There are multiple ways to control the protrusion:

First, try using a smaller amount in the Depth field in the Bump tab. In most cases, this can help you control the shapes.

Second, try modifying the Filters in the Tweaks group.

Third, modify the Filter in the Bump tab. Just bring down the keypoint in the far right. Try experimenting with different ‘heights’ for that keypoint until you get the right level of protrusion.

### **I have a question that is not answered here. Help!**

Visit our Facebook page at [facebook.com/QuadSpinner](https://facebook.com/QuadSpinner). We can help answer your questions about the MDK. We have a thriving community where you can also learn how other people are using the technology and gain insights on specific scenarios that you may be encountering.

# Related Training Resources

Visit our [Cornucopia3D.com](#) store for training videos, including:

## **Mighty HyperTerrains (Volumes I + 2)**

Learn how to create complex baked and live displacement objects, manage their polygon count effectively, and learn how to create elaborate shapes with precision. You can enhance your usage of the MDK MetaNodes and Kickstart Materials by using the techniques shown in this video.

## **Materials: Your Secret Weapon (Volumes I + 2)**

Learn how to create expansive materials that can capture nature's distinct look. See how to create functions for materials and apply that knowledge to enhance your usage of the MDK MetaNodes. With the techniques in these training videos, you can learn how to easily modify the MDK Kickstart Materials and create your own from scratch.

## **Realistic Procedural Terrains**

If you need a good introduction to the basics of the Function Editor, this classic resource can show you the ropes, and explain detailed methods to create procedural terrains. You can easily use any of the displacement MetaNodes in the MDK for procedural terrains.

# Realism in Vue

The most comprehensive book on Vue, **Realism in Vue**, provides extensive reference, visuals, and techniques for materials, displacement, HyperTerrains, HyperBlobs, and other key features that can help you extend your usage of the MDK MetaNodes.

Visit [www.RealismInVue.com](#) for details.

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