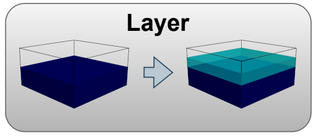
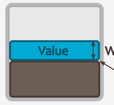
Basic Depositions

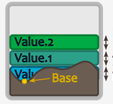
Layer





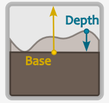
Layer(base,width,value):
Add a horizontal layer with *value* rock type. The height of the *base* and the *width* are specified.

Sedimentation



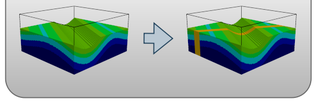
Sedimentation(value_list, thickness_list, base):
A sequence of horizontal layers are deposited. The number of values in *value_list* indicates total layers, [1,2,2,1] is four layers. The values in *thickness_list* are cycled through until all layers deposited. An optional *base* parameter indicates where to start from, if left empty, will deposit starting from lowest z-value rock.

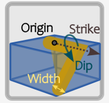
Unconformity



UnconformityBase(base,value):
UnconformityDepth(depth,value):
Replace rock with a new *value*, default is air. Two types of process, eroding upward to infinity from a *base*, or downward to an assigned *depth* from the highest rock point in the model.

DikePlane

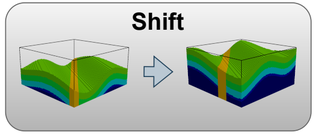


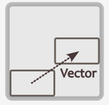


DikePlane(strike, dip, width, orgin, value):
Replace existing rock along the plane specified by *strike*, and *dip* angles, as measured from an *origin* point coincident with the dike plane. The intrusion extends to either side of the plane for a total *width* of rock replaces with *value*.

Basic Transforms

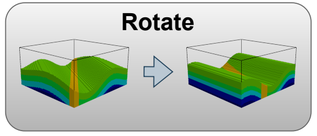
Shift

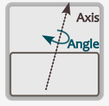




Shift(vector):
Shift the entire model by some *vector*. Produces a translated model.

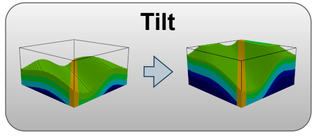
Rotate





Rotate(axis, angle):
Rotate the entire model about a fixed *axis* represented by a 3d vector by a CCW rotation *angle* in degrees. Left hand rule rotation.

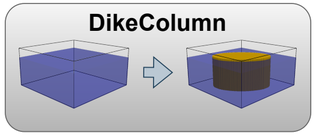
Tilt

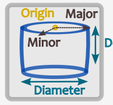


Tilt(strike, dip, origin):
A variation of Rotate that is specified by *strike* and *dip* angles. The *origin* is the reference point from which strike is measured.

Intrusions

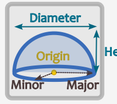
DikeColumn





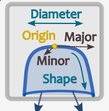
DikeColumn(origin, diam, depth, minor_scale, rotation, value, clip):
An elliptical column extending downward from *origin* for distance *depth*. The major axis is rotated by *rotation* degrees with the ratio of minor to major axis of the ellipse given by *minor_scale*. The rock is replaced by *value* and will not extend into the air if *clip* is True.

DikeHemisphere



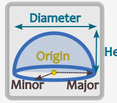
DikeHemisphere(origin,diam,height,minor_scale, rotation,value,upper, clip):
A hemispherical elliptic deposit with *origin, diameter,* and *height*. The *rotation* determines the major axis direction, with the minor axis scaled by *minor_scale*. A rock type *value* is assigned, and the *upper* boolean determines if upward or downward facing.

DikePlug



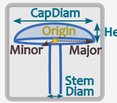
DikePlug(origin,diam,shape,minor_scale,rotation,value):
A polyomial profile elliptical intrusion with peak at *origin,* a scaled major *diameter* with a *minor_scale* for the minor axis. Major axis direction can have *rotation*, and the elevation profile is adjusted with *shape,* which gives a steeper profile with high values. Extends infinitely downward.

DikeHemispherePushed



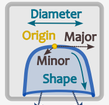
DikeHemispherePushed():
The same effect as DikeHemisphere but with additional rock layer displacement from the intrusion. Parameter selection is the same as the previous process.

Laccolith



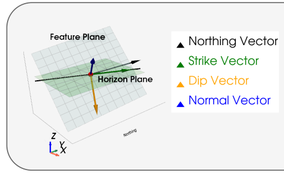
Laccolith(origin, cap_diam, stem_diam, height, minor_scale, rotation, value, upper):
Intrusion formed of a column and cap with the junction at *origin*, a *cap* and *stem* diameter, specified cap *height*, and an elliptical cross section determined by the ratio *minor_scale* and *rotation*. Setting *upper* to false creates a Lopolith instead.

DikePlugPushed



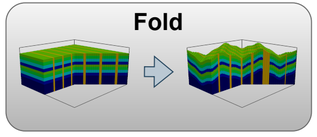
DikePlugPushed():
A DikePlug with additional displacement effects on the surrounding rock laters. Parameter selection is the same as the previous process.

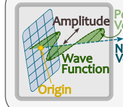
Tectonic Transforms



Strike is measured in degrees counter-clockwise from the y-axis.
Dip is measured as the angle between the feature plane and the horizon plane.
Normal vector is orthogonal to the strike and dip vectors.
Rake is a polarization angle measured relative to the dip vector.

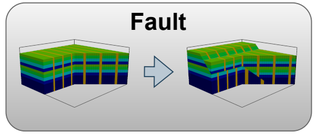
Fold

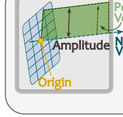




Fold(strike,dip,rake,period,amplitude,phase,shape, origin,func): A periodic transverse plane wave along normal direction and polarization indicated by *slip,dip,* and *rake*. *Period, phase* and *amplitude* modulate an underlying 1D wave *func,* normalized to unit amplitude. Default *func* is cosine with *shape* controlling a harmonic frequency.

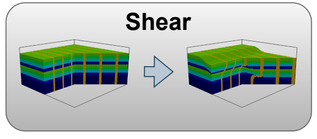
Fault

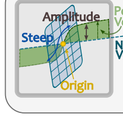




Fault(strike,dip,rake,amplitude,origin): A step function displacement occuring along a fault plane determined by the *strike, dip,* and *rake*. The plane is coincident with a specified *origin*, with a net displacement of *amplitude* along the slip vector direction as measured by *rake*.

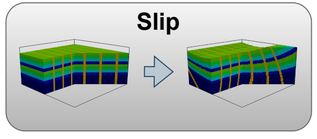
Shear

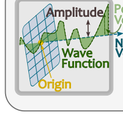




Shear(strike,dip,rake,amplitude, steepness, origin): A sigmoid function displacement occuring along a plane determined by the *strike, dip,* and *rake*. The plane is coincident with a specified *origin*, with a maximum displacement given by *amplitude* and a steepness modulated by *steepness.*

Slip

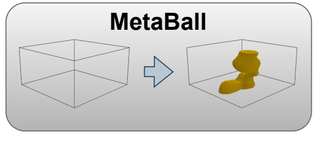




Slip(displacement_func, strike,dip,rake,amplitude,origin): A generalization of transverse plane wave deformations. Requires a 1D *function* that maps the amplitude of displacement along the plane wave. Shown to the left is a parabolic displacement. Fault, Fold, and Shear are all variations of the more general Slip process.

Procedural Deposition

MetaBall



MetaBall(balls, threshold, value, clip):
A process that forms a deposit using a surface potential generated by a list of Balls and a *threshold* potential. Each ball has an *origin, radius,* and *goo-factor*. Governing its contribution to the potential. A Ball list procedural generator is provided.