Oaktree Manual

April 19, 2012

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Input

Oaktree input language extends Python. Subroutines and objects related to input processing are listed below.

4.1 SIMULATION

SIMULATION object stores data specific to one distinct analysis.

obj = SIMULATION (outpath, duration, step, grid, cutoff, extents)

- **obj** - SIMULATION object
- **outpath** - output directory path
- **duration** - simulation duration
- **step** - time step
- **grid** - regular size of octree grid
- **cutoff** - cutoff length below which geometrical details are not resolved
- **extents** - tuple $(x_{min}, y_{min}, z_{min}, x_{max}, y_{max}, z_{max})$ of domain bounds

4.2 SUPERELLIPSOID

A superellipsoid is defined by the zero set of the implicit function

$$F(x,y,z) = \left(\left|\frac{x}{a}\right|^p + \left|\frac{y}{b}\right|^p\right)^{q/p} + \left|\frac{z}{c}\right|^q - 1.$$

This routine creates a translated superellipsoid in an initial orientation aligned with the global frame.

obj = SUPERELLIPSOID (center, radii, r, t, vcolor, scolor)

- **obj** - SHAPE object
- **center** - tuple (x, y, z) defining the center
- **radii** - tuple (a, b, c) defining the radii
- **p** - exponent p

- **q** - exponent q
- **vcolor** - integer volume color
- **scolor** - integer surface color

4.3 UNION

Set theoretic union of two shapes.

obj = UNION (shape1, shape2)

- **obj** - SHAPE object
- **shape1** - first input SHAPE object
- **shape2** - second input SHAPE object

4.4 INTERSECTION

Set theoretic intersection of two shapes.

obj = INTERSECTION (shape1, shape2)

- **obj** - SHAPE object
- **shape1** - first input SHAPE object
- **shape2** - second input SHAPE object

4.5 DIFFERENCE

Set theoretic difference of two shapes.

obj = DIFFERENCE (shape1, shape2)

- **obj** - SHAPE object
- **shape1** - first input SHAPE object
- **shape2** - second input SHAPE object

4.6 MOVE

Move shape linearly.

MOVE (shape, vector)

- **shape** - input SHAPE object
- **vector** - tuple (u, v, w) defining the translation

4.7 ROTATE

Rotate shape about an axis.

MOVE (shape, point, vector, angle)

- **shape** - input SHAPE object
- **point** - tuple (x, y, z) defining axis point
- **vector** - tuple (u, v, w) defining axis direction
- **angle** - oriented angle in degrees

4.8 SOLID

A solid is created in a simulation.

obj = SOLID (simu, shape, label)

- **obj** - SOLID object
- **simu** - simulation in which the solid is created
- **shape** - solid shape
- **label** - solid label

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