



## Gizmo Dimensions

The default Gizmo viewing volume is a space that is 4 units wide in all three dimensions. The actual display volume is two units in each dimension, centered in the middle of the viewing volume. Each dimension of the display volume extends from -1 to +1 about the origin. The display volume is smaller than the viewing volume to avoid clipping at the corners when the plot is rotated.

All drawing objects, such as spheres and cylinders, are sized in units of the +/-1 display volume. So, for example, if you create a box that is 2 units on a side, it completely fills the display volume. If you create a cylinder that is 3 units high, then the top of the cylinder is clipped because it extends outside the viewing volume boundary.

Superimposed on the display volume and precisely filling it is an axis coordinate system against which wave-based data objects such as scatter and surface plots are plotted. You can set the axis coordinate range for each dimension by choosing Gizmo→Axis Range. The axis coordinate system exists even though, by default, no axes are visible.

The axis coordinate system is autoscaled by default. Consequently, when you initially display a wave-based object, it fills the range of each axis. Since the axis coordinate system fills the display volume, the displayed wave-based object also fills the display volume.

When you display two or more wave-based objects at the same time while the axes are set to autoscale, Gizmo sets the range of each axis based on the minimum and maximum in the respective dimension of all data objects combined.

Once you turn autoscaling off, the axis range that you set determines the extent to which wave-based objects fill the display volume.

When you combine drawing objects and wave-based objects, the dimensions and positions of the drawing objects remain in +/-1 display volume units whereas the wave-based objects are displayed against the axis coordinate system.

## Gizmo Clipping

When you set the range of any axis, you may use values that do not include the full range of the data. To display the results correctly in this case, Gizmo creates clipping planes on the relevant sides of the display volume. Once created, these clipping planes affect both wave-based data objects and drawing objects. The clipping planes are not created unless a data object extends beyond the range of the axes.

If you want to do your own clipping, this automatic Gizmo clipping may interfere. To disable automatic clipping, for example for a surface object named surface0, you can execute:

```
ModifyGizmo modifyObject=surface0, objectType=surface, property={Clipped,0}
```

If you are working in advanced mode (see **Advanced Gizmo Techniques** on page II-466), you can create custom clipping planes to create special effects such as gaps in a surface plot. To use clipping planes, make sure that you are not using an axis range that is smaller than the span of the data in any dimension. Current graphics hardware support 6 to 8 clipping planes and axis-range clipping planes have a priority. For an example, open the Clipping Demo experiment.