

Spherical Coordinates

Given the spherical coordinates:

$$x = r \cos(t) \cos(f)$$

$$y = r \sin(t) \cos(f)$$

$$z = r \sin(f)$$

The inverse relationships can be expressed as:

$$r = \sqrt{x^2 + y^2 + z^2}$$

$$f = \arcsin\left(\frac{z}{r}\right)$$

$$t = \arctan\left(\frac{y}{x}\right)$$