

Copilot

Yes, I understand. You want `key_theta` and `key_phi` to represent the orientation of the largest axis of the ellipsoid, not the axis of rotation. Then, the other two axes of the ellipsoid should be constructed by adding or subtracting $\pi/2$ (90 degrees) to either `theta` or `phi`.

This can be achieved by modifying the way the rotation matrix is constructed. Instead of directly using `key_theta` and `key_phi` as the angles of rotation, you can create a rotation matrix that aligns the largest axis of the ellipsoid with a specific direction, and then apply additional rotations to construct the other two axes.

Here's a rough idea of how you might modify your code:

```
# Define the direction of the largest axis in spherical coordinates
key_theta = np.radians([0.0, 23.5, 48.79, 67.2, 80.0, 90.0])
key_phi = np.radians([0.0, 0.0, 0.0, 10.0, 17.5, 17.5])

# Convert spherical coordinates to Cartesian coordinates
key_direction = np.column_stack([
    np.sin(key_theta) * np.cos(key_phi),
    np.sin(key_theta) * np.sin(key_phi),
    np.cos(key_theta)
])

# Create a rotation matrix that aligns the z-axis with the key direction
key_rot = sp.spatial.transform.Rotation.align_vectors(
    np.array([[0, 0, 1]] * len(key_times)), # z-axis
    key_direction # key direction
)[0]

# Apply additional rotations to construct the other two axes
# ...
```

This code first converts the spherical coordinates `key_theta` and `key_phi` to Cartesian coordinates to get the direction of the largest axis in 3D space. Then, it uses the `align_vectors` function to create a rotation matrix that aligns the z-axis (which represents the largest axis of the ellipsoid before rotation) with this direction. The resulting `key_rot` represents the rotations that align the largest axis of the ellipsoid with the desired direction.

You would then need to apply additional rotations to construct the other two axes of the ellipsoid. The exact code for this would depend on how you want to define the orientations of these axes.

I hope this helps! Let me know if you have any other questions. 😊