Physics 711, Symmetry Problems in Physics Fall 2005

Homework

Due 11/8/05

1. Find the eigenvalues and eigenvectors for a general rotation. Use the eigenvectors as the basis vectors for your analysis.

2. What parameter(s) label conjugacy classes for $SO(3)$?

3. Find the elements of $SU(2)$ that correspond to the rotation by θ around the z-axis in $SO(3)$.

4. Find the elements of $SL(2, C)$ that correspond to the boost by hyperbolic angle ϕ in the z-direction in $SO(1, 3)$.