

October 29, 2008

PHYS 6333 (General Relativity)

Assignment #9, Due pm Wednesday November 5, 2008

1. A gyroscope circles the earth at a constant altitude h above it's surface. If the spinning gyroscope initially points vertically, in what direction does it point after one revolution of the earth? Assume the gyroscope's orbit is a circular geodesic of the Schwarzschild metric and it's pointing direction is parallelly transported. Assume the orbit is in the $\theta = \pi/2$ plane and in one revolution around the earth ϕ changes by 2π .
2. Compute the scalar $R_{abcd}R^{abcd}$ for the Schwarzschild metric.