Orbital Mechanics in General Relativity -
Applying Special Functions to Schwarzschild Geodesics

Hunter Lowe [1]

Einsteins theory of gravity, General Relativity, is used to describe the orbital mechanics of objects in strong gravitational fields. A description of how Einstein's gravity differs from Newton's gravity (philosophically and physically) will be given. In particular, a test mass orbiting a heavy, uncharged, slowly rotating, and spherically symmetric mass (such as certain black holes) will be analysed. Special function techniques are outlined and implemented in Python for calculating the orbital paths.

[1]Department of Physics, University of Northern British Columbia, Prince George, BC, V2N4Z9, Canada (loweh@unbc.ca).