Neutron star structure in alternative theories of gravity[1] DIM-
ITRIS MANOLIDIS, Washington University in St. Louis, CLIFFORD WILL, Uni-
versity of Florida — We study the structure of neutron stars in a broad class of
alternative theories of gravity. In particular, we focus on scalar-tensor theories and
$f(R)$ theories of gravity. We construct static and slowly rotating stars numerically
for a set of equations of state, including a polytropic model and more realistic equa-
tions of state motivated by nuclear physics. Observable quantities such as masses,
radii, etc are calculated for a set of parameters of the theories. We also calculate
the sensitivity of the mass of the models to variations in the asymptotic value of the
scalar field at infinity. These quantities enter post-Newtonian equations of motion
and gravitational waveforms of two body systems that are used for gravitational-
wave parameter estimation, in order to test these theories against observations.

Dimitris Manolidis
Washington University in St. Louis

Date submitted: 15 Jan 2013   Electronic form version 1.4