

Abstract Submitted
for the FWS21 Meeting of
The American Physical Society

Sounds Speed in Neutron Stars with Hyperons¹ VINH TRAN, PRASHANTH JAIKUMAR, California State University, Long Beach — The exact composition of matter in the interior of a neutron star is unknown. One such composition is the standard neutron, proton, electron matter. However, due to the high pressures, it is also possible for heavier particles like hyperons, baryons that include one or more strange quarks, to exist. The composition of neutron stars has an immediate effect on g-mode oscillations of neutron stars, through the dependence on two sound speeds – the adiabatic and equilibrium sound speed. We study the two sound speeds in dense matter with hyperons. The difference between the two sound speeds, though small in magnitude, is crucial in supporting g-mode oscillations. We observe a noticeable, sharp rise in the frequencies when we consider hyperonic matter versus standard neutron, proton, electron matter. The hope is that with third-generation gravitational wave detectors, we should be able to detect g-mode oscillations in neutron stars and thereby constrain the type of matter contained inside of neutron stars.

¹Supported by National Science Foundation Grant PHY-1913693

Vinh Tran
California State University, Long Beach

Date submitted: 17 Sep 2021

Electronic form version 1.4