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Axial Symmetric Solutions to Einstein's Field Equations for Deformed Neutron Stars[1] OMAIR ZUBAIRI, Department of Sciences, Wentworth Institute of Technology, FRIDOLIN WEBER, Department of Physics, San Diego State University and Center for Space Sciences, University of California, San Diego
— Traditional models of neutron stars are constructed under of assumption that they are perfect spheres. This is not correct, however, if the matter inside of neutron stars is described by an non-isotropic model for the equation of state. Examples of such stars are magnetars and neutron stars that would contain color-superconducting quark matter. In this work, we derive the stellar structure equations which describe the properties of non-isotropic neutron stars. The equations are solved numerically in two dimensions. We calculate stellar properties such as masses and radii along with pressure and density profiles and investigate any changes from conventional spherically symmetric neutron stars.

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