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Gravitational Redshift of Deformed Neutron Stars[1] ALEXIS ROMERO, San Diego State University, OMAIR ZUBAIRI, Computational Science Research Center and Department of Physics, San Diego State University, FRIDOLIN WEBER, Department of Physics, San Diego State University — Non-rotating neutron stars are generally treated in theoretical studies as perfect spheres. Such a treatment, however, may not be correct if strong magnetic fields are present and/or the pressure of the matter in the cores of neutron stars is non-isotropic, leading to neutron stars which are deformed. In this work, we investigate the impact of deformation on the gravitational redshift of neutron stars in the framework of general relativity. Using a parameterized metric to model non-spherical mass distributions, we derive an expression for the gravitational redshift in terms of the mass, radius, and deformity of a neutron star. Numerical solutions for the redshifts of sequences of deformed neutron stars are presented and observational implications are pointed out.

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