

Abstract Submitted
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Ground state properties of pf shell even-even nuclei in a mean-field model with a modified separable monopole interaction.¹ JIRINA STONE, University of Oxford, WILLIAM WALTERS, University of Maryland — The non-relativistic Hartree-Fock mean field model with modified separable monopole interaction has been used to calculate ground state properties of even-even $20 < Z < 32$ nuclei, including binding energies, mean-square radii, charge density distributions, neutron skins and geometrical shapes. Parameters of the separable interaction are adjusted to known properties of finite nuclei, including nuclei away from closed shells, as well as to expected features of symmetric and asymmetric nuclear matter and the mass-radius relationship in cold, non-rotational neutron stars. The results are compared to the outcome of the same model with more traditional Skyrme-type interactions SLy4 and SkI3. The similarities and differences of the models are discussed and attributed to the treatment of isospin degrees of freedom. Calculated bulk properties, such as binding energies and shape parameters, are also compared to the Finite-Range-Liquid-Droplet (FRLD) model predictions.

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