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Atomic 2F Rydberg States Calculations Using Explicitly Correlated Gaussian Basis Functions NIKITA KIRNOSOV, KEEPER SHARKEY, LUDWIK ADAMOWICZ, University of Arizona — Very accurate variational nonrelativistic calculations are performed for Rydberg (2)F states of the lithium atom ((7)Li). The wave functions of the states are expanded in terms of all-electron explicitly correlated Gaussian functions and finite nuclear mass is used. The exponential parameters of the Gaussians are optimized using the variational method with the aid of the analytical energy gradient determined with respect to those parameters. The results of the calculations allow for refining the experimental energy levels determined with respect to the (2)S 1s(2)2s(1) ground state.

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