

Abstract Submitted  
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**Advances in laser spectroscopy of lithium** WILLIAM A. VAN WIJNGAARDEN, HANG YANG, BIN JIAN, York University — A number of experiments have precisely measured fine and hyperfine structure splittings as well as isotope shifts for several transitions at optical frequencies for  ${}^{6,7}\text{Li}$ . These data offer an important test of theoretical techniques developed by two groups to accurately calculate effects due to QED and the finite nuclear size in 2 and 3 electron atoms. The work by multiple groups studying several transitions in both  $\text{Li}^+$  and neutral Li permits a critical examination of the consistency of separately, the experimental work as well as theory. Combining the measured isotope shifts with the calculated energy shifts passing these consistency tests permits the determination of the relative nuclear charge radius with an uncertainty approaching  $1 \times 10^{-18}$  meter which is more than an order of magnitude better than obtained by electron scattering. Prospects for a precision measurement of the fine structure constant are also discussed.

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