

Abstract Submitted
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Measurement of the $10p$ fine structure interval of lithium PAUL OXLEY, PATRICK COLLINS, The College of the Holy Cross — The fine structure interval of the $10p$ atomic state of 7Li has been measured by laser spectroscopy. Our result of 74.97 (74) MHz for the $10p$ interval has a precision five times higher than previous measurements of fine structure intervals of Rydberg lithium p states. It also provides an experimental value for the only $n=10$ fine structure interval which is yet to be calculated theoretically and therefore provides a benchmark for such a calculation. In our experiment a beam of lithium atoms is excited by a total of four grating-stabilized diode lasers. The excitation to the $10p$ state proceeds via the $2p$ and $3s$ intermediate states. Three of the lasers are frequency locked to their respective optical transitions and the fourth is scanned across the $10p$ fine structure components. Optical sidebands imprinted on this fourth laser provide a calibration for the scan and allow a determination of the fine structure interval.

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