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Lattice based spectroscopy on an even isotope of Yb ZEB BARBER[1], CHAD HOYT, CHRIS OATES, LEO HOLLBERG, NIST-Boulder — Recent advances in neutral-atom optical lattice clocks are beginning to show the promise of this high accuracy, high stability clock scheme. Until now, experimental progress has focused on the naturally occurring $^1S_0 - ^3P_0$ transition in the odd isotopes of Sr and Yb. We present 1D lattice spectroscopy based on this transition in an even isotope of Yb using a magnetically induced spectroscopic method. This method utilizes a moderate (∼1mT) magnetic field to mix the upper clock state with a nearby allowed state to create a nonzero excitation probability at the clock wavelength of 578.42nm. Narrow linewidths of ∼20Hz with good signal-to-noise ratios were observed and a Stark-free wavelength of 759.35+/-.02nm was measured using the ^{174}Yb isotope. This simple method, whose frequency errors could be held well below 10^{-17}, is equally suitable for other atoms such as Sr, Ca, and Mg. Through eliminating errors associated with the Zeeman substructure of the odd isotopes, this method should accelerate high accuracy evaluation of current optical lattice clock experiments.

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