Reducing the effect of light shift on a pulsed CPT-based clock

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Vapor cell atomic clocks are widely appreciated for their excellent short-term fractional frequency stability and their compactness. However, they are known to suffer on medium and long time scales from significant frequency instabilities, generally attributed to light-induced frequency shift effects. We will show the in-progress improvement of a high-performance Cs cell CPT-based atomic clock. There will be a strong emphasis on the first realization and result of the auto-balanced Ramsey interrogation protocol on a CPT-based Cs cell clock showing promising results for significantly reducing the effect of light shift on the frequency. The Allan deviation of the clock frequency has been improved to $2 \times 10^{-13}\ \tau^{-1/2}$ for 10000 s of averaging time reaching 2×10^{-15} at 10000 s.