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Laser Spectroscopy of Trapped Ions

# Absolute frequency measurement of the $^2S_{1/2} \rightarrow ^2F_{7/2}$ optical clock transition in $^{171}\text{Yb}^+$ with an uncertainty of $4 \times 10^{-16}$ using a frequency link to international atomic time

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## Abstract

The highly forbidden  $2S_{1/2} \rightarrow 2F_{7/2}$  electric octupole transition in  $^{171}\text{Yb}^+$  is a potential candidate for a redefinition of the SI second. We present a measurement of the absolute frequency of this optical transition, performed using a frequency link to International Atomic Time to provide traceability to the SI second. The  $^{171}\text{Yb}^+$  optical frequency standard was operated for 76% of a 25-day period, with the absolute frequency measured to be 642 121 496 772 645.14(26) Hz. The fractional uncertainty of  $4.0 \times 10^{-16}$  is comparable to that of the best previously reported measurement, which was made by a direct comparison to local caesium primary frequency standards.

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## Notes

No potential conflict of interest was reported by the authors.

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## Additional information

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