

# Progress on $^{40}\text{Ca}^+$ Optical Clock

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The systematic uncertainty of the clock has been improved to below  $3.0^{-18}$  was achieved under a cryogenic (liquid nitrogen temperature) environment [1] and below  $4.8^{-18}$  under a room-temperature [2]. Meanwhile, the stability of the  $^{40}\text{Ca}^+$  optical clock has been improved to  $6.3^{-18}$  in an averaging time of 524,000 s [3]. A robust and transportable clock installed in an air-conditioned car trailer has achieved performance almost as good as that of the laboratory clocks [4]. The absolute frequency of the  $^{40}\text{Ca}^+$  optical clock transition was remeasured as 411 042 129 776 400.41(23) Hz, with a fractional uncertainty of  $5.6^{-16}$  referenced to the SI second via satellite frequency transfer links. This radiation is now endorsed as a secondary representation of the second by the Consultative Committee for Time and Frequency (CCTF) at its 22nd session in 2020 and 2021[4].

## References

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