

Future of atomic clock towards the redefinition of the Second

Second is the SI unit of time, it has been defined as the oscillation of the two-level quantum system. Since 1967, the definition based on the microwave frequency, 9 192 631 770 Hz, between the hyperfine ground state of the cesium atom at a temperature of 0K. The uncertainty of the microwave clock has reached the level of 10^{-16} . The next generation of atomic clock will move from microwave to optical transition. Atoms in optical lattice and a trapped single-ion have been illustrated that they are two-order of magnitude better than the microwave clock. The optical clock transition of various atoms has been measured and compared. The Consultative Committee for Time and Frequency (CCTF) has already planned to consider the redefinition of the Second in 2026. In Thailand, an Ytterbium ion clock has been studied to realize the next generation of time keeping.

Primary author: PHOONTHONG, Piyaphat (National Institute of Metrology (Thailand))

Presenter: PHOONTHONG, Piyaphat (National Institute of Metrology (Thailand))

Track Classification: Atomic Physics, Quantum Physics, Molecular and Chemical Physics