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Cooling and crystallization of trapped single 171Yb+ ion for optical frequency standard

By measuring the frequencies emitted as atoms transition between energy levels, atomic frequency standards are among the most advanced devices available for keeping time. Here, we report our recent progress in developing an optical frequency standard based on a single $^{171}Yb^{+}$. With the laser Doppler cooling, a single ytterbium ion is cooled to crystallization and the temperature of the ion crystal is estimated to be below 1 mK. The progress reported in here is the first step of the project and paves the way for future development.

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