



# 复旦大学物理系 Colloquium

Time: 14:00, Tuesday, 2022.9.20

Location: C108, Jiangwan Physics Building

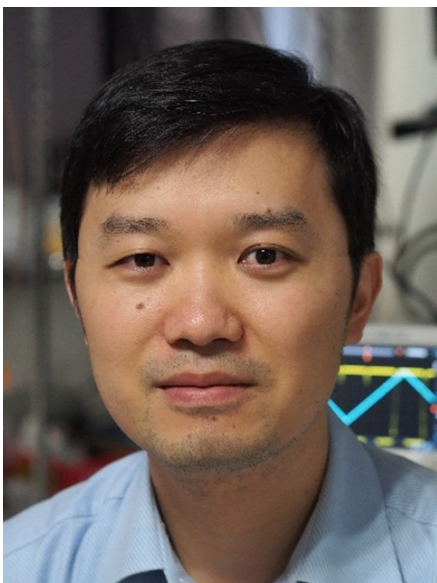
Tencent Meeting ID: 555-1423-1738, Password: 2005

## Measurement of the electric dipole moment (EDM) of $^{171}\text{Yb}$ atoms in an optical dipole trap (ODT)

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**Abstract:** The permanent electric dipole moment (EDM) of atoms, molecules, and elementary particles is predicted in the standard model. While it is too small compared with the experimental measurement sensitivity, it is an important method to search for beyond-standard-model physics via CP violating mechanisms. In our work, EDM of the  $^{171}\text{Yb}$  atoms is measured with atoms held in an optical dipole trap. A quantum nondemolition measurement with a spin-detection efficiency of 50% is realized. A systematic effect due to parity mixing induced by a static E field is observed, and is suppressed by averaging between measurements with optical dipole traps in opposite directions. The coherent spin precession time is found to be much longer than 300 s. The measurement result leads to an upper limit of  $|d(^{171}\text{Yb})| < 1.5 \times 10^{-26} \text{ e cm}$  (95% C.L.). These measurement techniques can be adapted to search for the EDM of  $^{225}\text{Ra}$ .



**Biography:** Tian Xia is a Research Associate Professor of Hefei National Research Center for Physical Sciences at the Microscale at the University of Science and Technology of China. He got this bachelor's degree at Tsinghua University and Ph.D. at Princeton University. He later worked as a post-doctoral research associate at the University of Wisconsin-Madison on quantum computing with neutral atoms trapped in a 2-D tweezer array. In 2015, he joined USTC. His current focus is the precision measurements with cold atoms and searching new physics beyond standard model.