

# **Rydberg-based quantum sensor using atomic vapors and its applications**

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I will give an overview of the Rydberg-state atom, EIT, quantum sensor, and quantum-state manipulation. Rydberg-atom spectroscopy can be used for measuring atomic interactions between atoms or detecting DC to THz external fields sensitively. When an external field or atomic interactions cause the energy level shifts, a narrow and high contrast EIT feature can provide useful information. Our investigation advances applications such as dipole-dipole interaction in highly excited Rydberg states, laser-frequency stabilization, and traceable detection of the environment electromagnetic field as a quantum sensor. The future study aims to generate multiple quantum bits and gates with thermal Rydberg atoms in miniaturized devices.