

# Measurement of Earth rotation and gravitation with atom interferometry

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By exploiting the Doppler shift of narrow, stimulated Raman, resonances in atomic clock systems, we are able to spectroscopically measure rotations and gravitational forces with unprecedented sensitivity and accuracy. Consideration of photon momentum recoil during the Raman processes leads to the interpretation of the observed resonances as a manifestation of de Broglie wave interference. Scientific applications of these techniques include tests of General Relativity and possible tests of string theory. Technological applications range from next-generation inertial navigation systems to oil and mineral exploration.