

PRECISION SPECTROSCOPY OF HD

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Precision spectral measurement of simple molecules such as H₂ and their isotopes is one of the important research fields of spectroscopy. Combined with accurate calculations, allows us to test the fundamental quantum chemistry theory and to determine the fundamental physical constants such as the proton-to-electron mass ratio. Here we present the Doppler-free spectroscopy measurements of first overtone transition of HD at a temperature as low as 10K, measured the saturated absorption spectrum of the first overtone transition of HD and observed the Doppler free spectral of R₀ (2-0) for the first time. The line profile is different from the saturated absorption spectrum. We analyzed the line profile and it is expected to determine the transition frequency with 11 digits.