HIGH-FINESSE OPTICAL CAVITY SYSTEM FOR SPECTROSCOPIC MEASUREMENTS AT CRYOGENIC TEMPERATURES

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The use of high-finesse optical cavities in molecular spectroscopy is essential due to the ultra-long path of molecule-light interaction, which directly determines the high sensitivity of the technique. Performing spectroscopy under cryogenic conditions, among other benefits, allows for precise determination of spectra for large molecules, studying collisional line-shape effects at low energies, and achieving high accuracy of measurements conducted for simple molecules, which is important in fundamental studies [1]. We will demonstrate a system designed to perform spectroscopic measurements utilizing an optical cavity in a wide temperature range, from room temperature to cryogenic regime (below 10 K) [2]. We will present problems, solutions, and the results that we obtained so far in this project.

References

[1] Mikołaj Zaborowski, Michał Slowiński, Kamil Stankiewicz, Franck Thibault, Agata Cygan, et al. Optical Letters 45, OL.389268 (2020).

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