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Optical interferometry and refractive index measurement at sub-angstrom resolution MINSU KIM, UIUC — In this laboratory, the confinement of fluids between atomically-smooth crystals of muscovite mica is presently being combined with single-molecule fluorescence spectroscopy and high-resolution confocal Raman spectroscopy. Furthermore, the traditional methods of optical interferometry can be enhanced by using a high-resolution CCD camera to analyze many more interference fringes than is customary using the surface forces technique, thereby achieving a resolution an order of magnitude better than the customary 1-4 angstroms. This allows us to consider the molecular alignment of chain fluids through measurement of the local refractive index. Concerning aqueous salt solutions, it allows us to consider the local refractive index within the Stern layer itself. Different findings are obtained depending on the method of mica cleavage. This provides a pleasing resolution to some inconsistencies in prior literature.

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