HOLOGRAPHY: READ ME FIRST 10/7/13

Introduction

The printed lab reader and electronic versions of the holography lab offer a broad and comprehensive look at holography. Several years ago it was decided to add a quantitative aspect to the lab. Holographic interferometry (HI) was introduced to meet this goal. To make room, the Michelson interferometer segment was dropped and turned into a separate lab. Subsequently, the HI lab underwent major changes the winter '13 quarter. Please be patient, as the changes are extensive.

Page references will be in the following format: XX(ab). The first page reference is for the lab reader; the second for the electronic (web) version.

Pg. 54(2): Delete #2, 3, 5, and 6. Deliverables: two single side-referenced transmission holograms.

Pg. 55: Delete #2

Pg. 56(4): Delete #3

Pg. 57(5); Fig 2c is incorrect. See correction on web page.

Pg. 59(7): Delete #5

Pg. 62(10: Delete #6

Pg. 66(14: Delete questions 7.2, 7.3, 7.5

Appendix A: Delete TYPE I and TYPE II. We use TYPE III process.

Appendix B: Pages 78(21) and 79(22) contain comments about the difficulty in seeing the real (psuedoscopic) image. These comments cannot be farther from the truth. You will see both the virtual (orthoscopic) and real images with ease.

Appendix B, pg. 80(23). My personal recommendation is reference (4) by Smith. Both editions are in our campus library. You will also find information on laser coherence length.

HOLOGRAPHIC INTERFEROMETRY

Pg. 86(1): section 1. Answer ONLY question one. The others refer to the interferometer.

Pg. 88(3). The experiment has been modified to allow the force to be applied to the rear of the beam producing a deflection (displacement) head-on toward the emulsion for maximum efficiency. You will make several double exposure holograms with forces varying between 0.2 – 1 Newton.

Determine a relationship between the displacement and the TOTAL number of dark fringes observed. Plot your data and determine a function describing your data.