

Digital holographic imaging of rough surfaces

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This presentation is focused on explaining a technique that will provide insight on the structure of rough surfaces. We have constructed what is essentially a Michelson interferometer; one arm illuminates the surface and collects the back-scattered light, and the other arm provides the reference beam. Both beams then interfere and create the hologram, which is recorded on a CCD. Some surfaces we have measured include a window with ragweed pollen, a cluster of fiberglass, and deposited salt crystals on a slide. Thus far, we have successfully generated two dimensional images of these surfaces with a resolution on the order of $\sim 3\text{--}4$ micrometers. The goal is to extend this by generating a three dimensional model of the surface in question.

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