Progress in writing a paper titled:

**"Single-shot, digital holographic microscopy using partially coherent, instantaneously bright, light from second harmonic generation".**

**Abstract:** Digital Holographic Microscopy (DHM) with long coherent lengths such as He-Ne is widely used for imaging of biological samples. The main drawback of using DHM based long coherent lengths is the appearance of spurious noise in reconstructed phase image. In this paper, we achieved practically a wide-field DHM phase imaging configuration with no spurious noise in phase-contrast image. The configuration is comprised of a Mach-Zehnder interferometer at transmission and Mode-locked Er-doped fiber laser with a waveguide periodically poled lithium niobate (PPLN) crystal unit. The PPLN is used to convert a wavelength of 1556 nm into the operating wavelength region of the CCD camera used. Single-shot off-axis hologram with uniform contrast over the entire field of view is recorded to reconstruct a phase map utilizing the convolution based Fresnel method. The nature of single-shot in the off-axis configuration enables an interferometric recording time on a millisecond scale. The powerful of the proposed setup is verified by imaging a biological sarcomere sample, and the experimental results show that the phase noise is efficiently suppressed by an order of 68% when compared to a He-Ne laser-based result. Merits of the proposed technique include real time, high resolving power, and no spurious noise at all in the reconstructed object wave. Furthermore, the proposed technique can provide a fast inspection of uniformity of samples in optoelectronic industry.

**1- Introduction: Finished**

**2- Numerical reconstruction: Finished**

**3- Experimental results: to be continued**

At present:

1- Writing in the manuscript
2- Going to measure the coherence length of the SHG light
3- Arrange the data and working on noise suppression in phase image (see fig.1(c))
4- Going to measure a sarcomere sample by AFM.

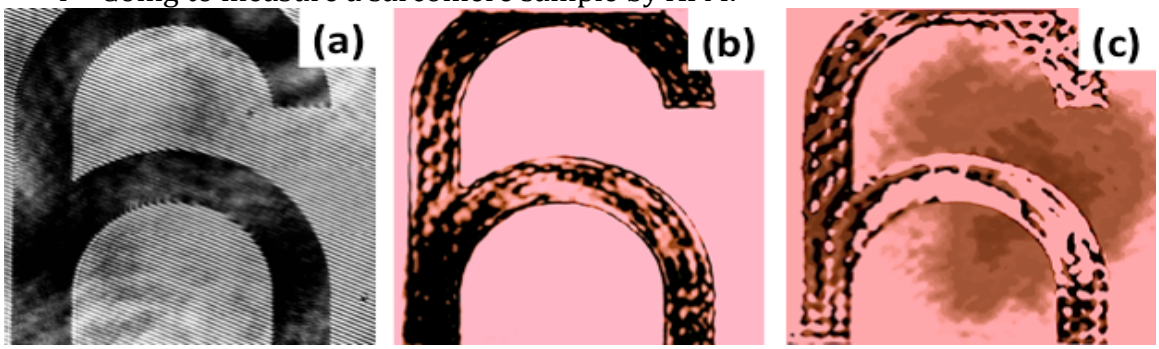


Fig.1. Reconstruction by convolution based Fresnel method, hologram (a), Intensity (b), and phase (c).