

3D small object simulation by using Mach-Zehnder interferometry

In order to study small biological objects which cannot be observed with naked eyes, microscope is a common tool using nowadays, but it can be used to observe only 2-dimensions images. Thus in this work, we applied Mach-Zehnder interferometer to create interference fringe using beam expander and 10x lens to expand the image's size, and saved it with CMOS camera into the computer for analysis the image with MATLAB program using Fast Fourier Transform and 2D Filter. Then the intensity of each pixel is read and transformed into the 3D graph. The result show that the shape of monocot plant stem tissue. The studied sample is the square plate with concavity in the middle. It means that the border is thicker than the middle, according to the biological shape of monocot plant stem tissue. Therefore, we can conclude that this technique can be used to investigate small transparent objects. Moreover, we expect that the smaller objects can be investigated precisely if the higher magnifier lens are used.

Authors: Mr SURACHAIRATTAKUL, Nattapat (Mahidol Wittayanusorn School); Mr PATSAWANKUL, Pawat (Mahidol Wittayanusorn School); Mr SAMCHUSRI, Supawit (Mahidol Wittayanusorn School)

Presenters: Mr SURACHAIRATTAKUL, Nattapat (Mahidol Wittayanusorn School); Mr PATSAWANKUL, Pawat (Mahidol Wittayanusorn School); Mr SAMCHUSRI, Supawit (Mahidol Wittayanusorn School)

Track Classification: Optics, Non-linear Optics, Laser Physics, Ultrafast Phenomena