

Week VIII Report

Advanced Experimental Physics II

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Magnetic Domain

PROGRESS REPORT

In this lab we mostly collected the data. The microscope was set up to detect the image. We then using the software from the microscope used that to capture images. These images were saved as .png files. The images showed the sample at several input currents.

We started out with the Experiment A: 'Playing Hard'. Starting with a demagnetizing the sample at 0A current and increasing every 50mA we stopped at 450mA and saved the images we took at each increment. From 450mA we decreased every 50mA all the way to zero and saved the images. We then flipped the direction of the current and without de-magnetizing the sample we increased (negatively) again every 50mA up to $-450mA$ and then decreased back to 0mA. We noticed that that by increasing the current we were able to magnetize the sample and the sample stayed magnetized well into $-39mA$.

We collected data the same way for Experiment B 'Play Soft' but, instead using 10mA increments and stopping when the material was fully magnetized. However, there was an issue with Experiment B. We had not properly note down when the material was full magnetized. Furthermore it was hard to decide when the material was fully magnetized. This caused some issues when analyzing and processing the data.

We decided to the data/image analysis in Python. This is when we realized that some images did change 'color'. The change in color is due to the sample having two layers that could create magnetic domains and when they line up a certain way the colors would change from yellow and brown to yellow and green. This impeded our ability to produce Hysteresis images in week 8. To compensate for the lack of images we will show our conversion from RGB image to binary for a few sample images. The images were converted from RGB to grayscale using the "skimage" package using the "rgb2gray" function.

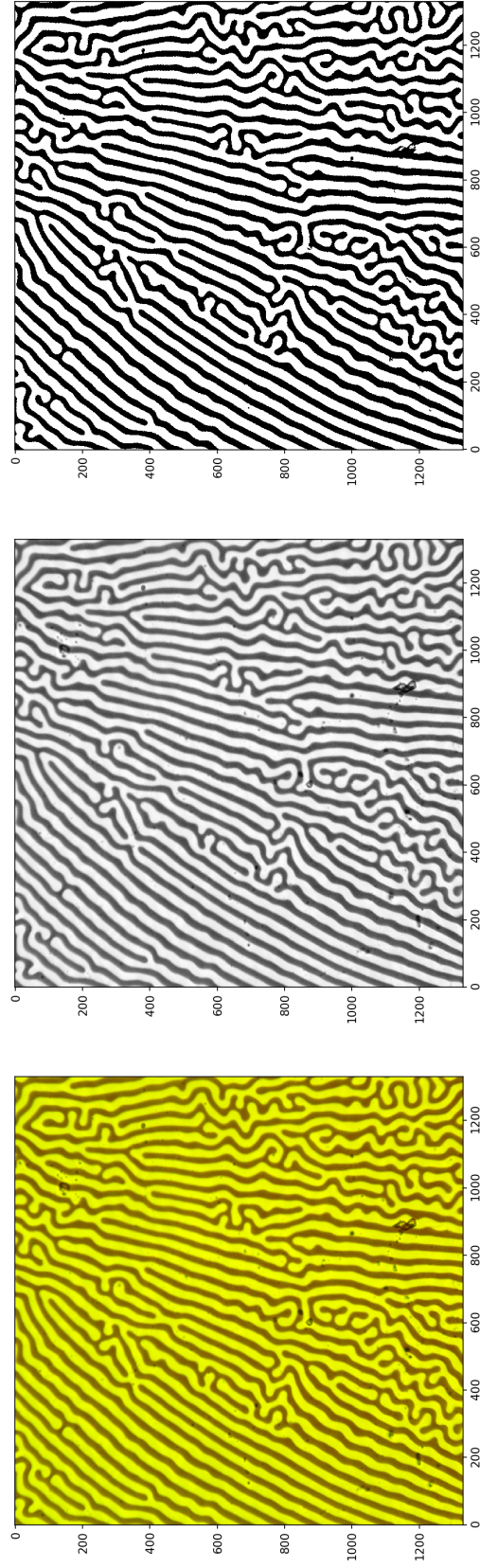


FIG. 1. Shows the conversion from Rgb to Binary image. Sample shown was taken in its unmagnetized state with 0 Amps of current.