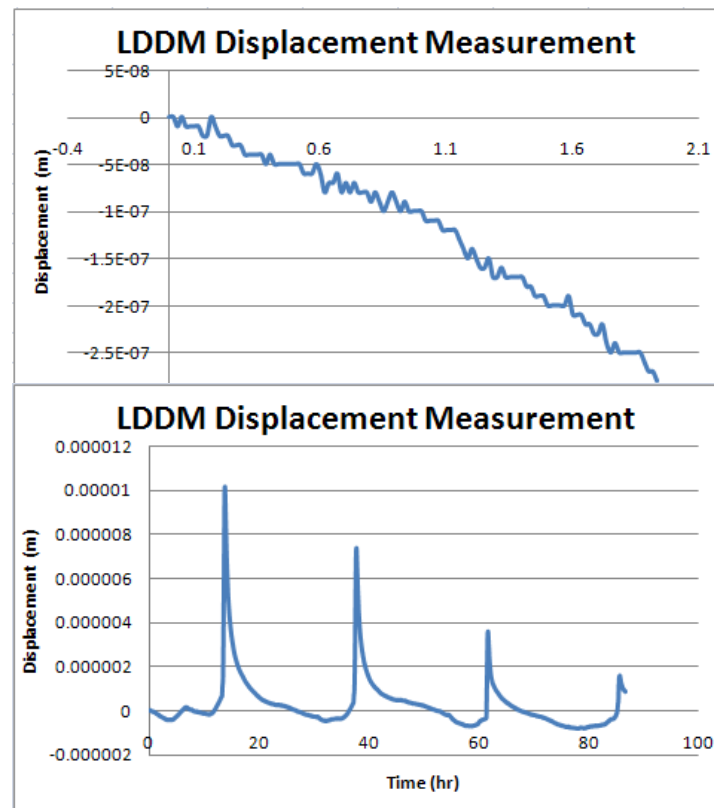# Improving Hard X-ray Nanoprobe

Qingyi Wang, 2010 Lee Teng Internship

The Hard X-Ray Nanoprobe

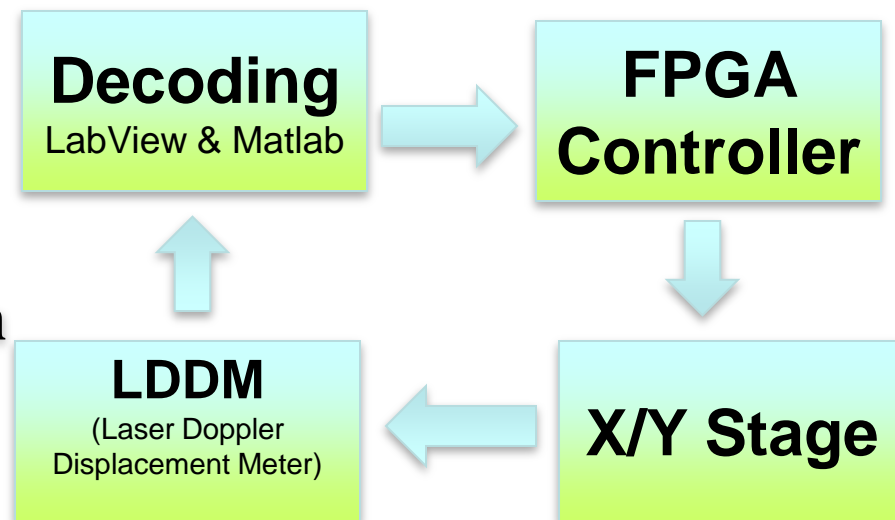Hard X-Ray Nanoprobe, the laser decoder, and the piezo controller.

It's extremely sensitive to operation conditions (noise, vibration, hysteresis, etc). However, we want the instrument to be robust and give us repeatable and reliable measurements.
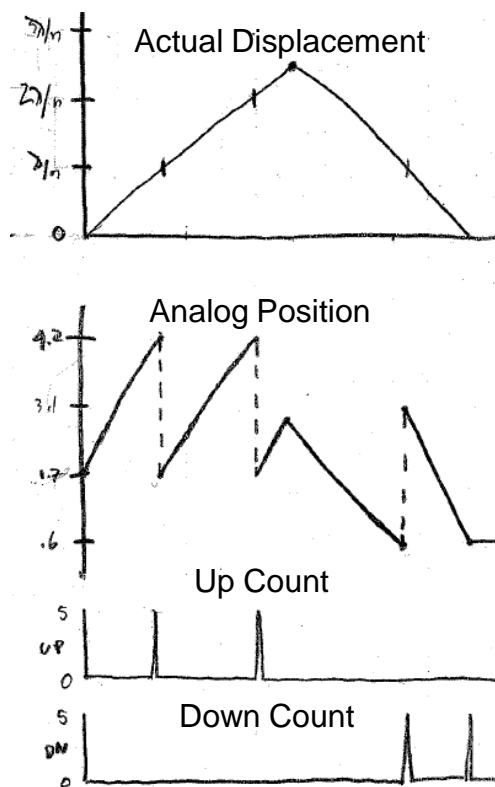
The Plan

GOAL: Develop a new control algorithm to precisely control the nanoprobe motion.

- Decode the LDDM processor unit signal and reconstruct the position.

- Identify and model the dynamics of the existing system

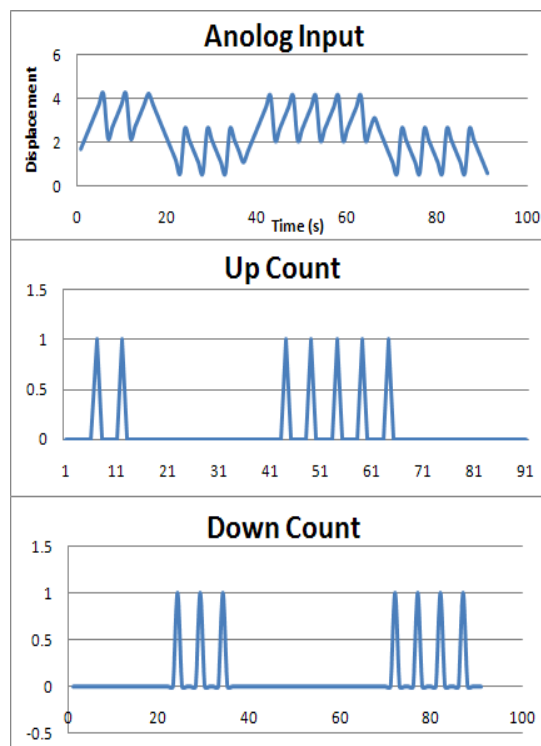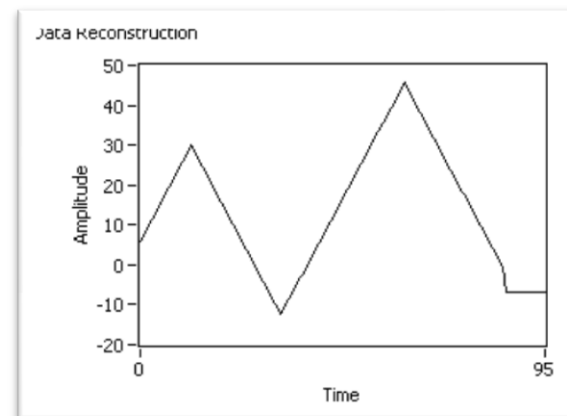- Implement a control system and quantify the performance.

Decoding
LabView & Matlab

FPGA Controller

X/Y Stage

LDDM
(Laser Doppler Displacement Meter)

Decoding

Example LDDM processor unit output.

Dummy data I made to test the LabView reconstruction code.

Actual Displacement

Analog Position

Up Count

Down Count

Anolog Input

Up Count

Down Count

Reconstruction output.

Data Reconstruction

Acknowledgement

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