

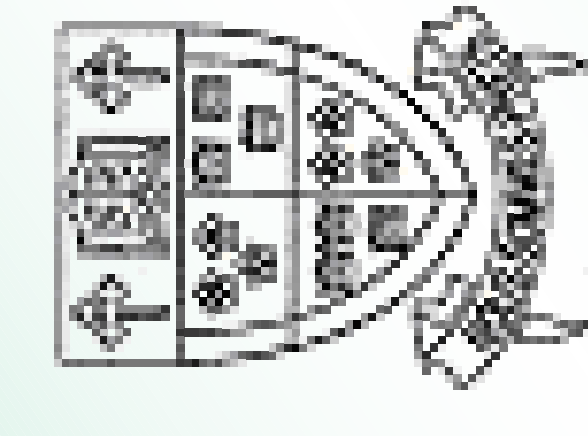
The Effects of Proton Irradiation on Electro-thermal Actuators

Introduction

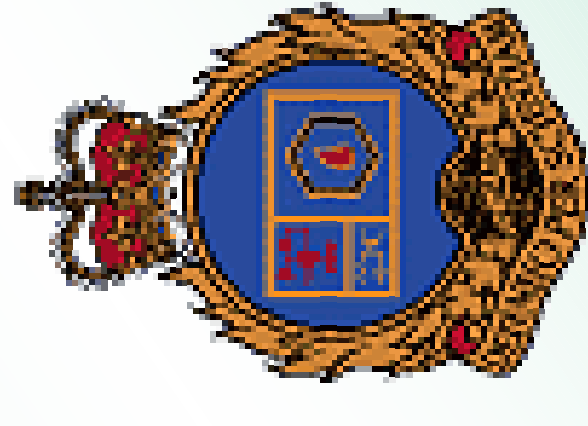
We took several electro-thermal actuators to TRIUMF for proton irradiation. The actuators were all 200µm long and fabricated using the MUMPS process, which is available through Cronos.

The actuators show discolouration and visible pitting at higher doses. Despite this, the actuators displayed minimal change in behaviour except at high doses. The changes include a slightly lowered resistance and smaller displacement.

We plan further research using different proton energies and gamma radiation.

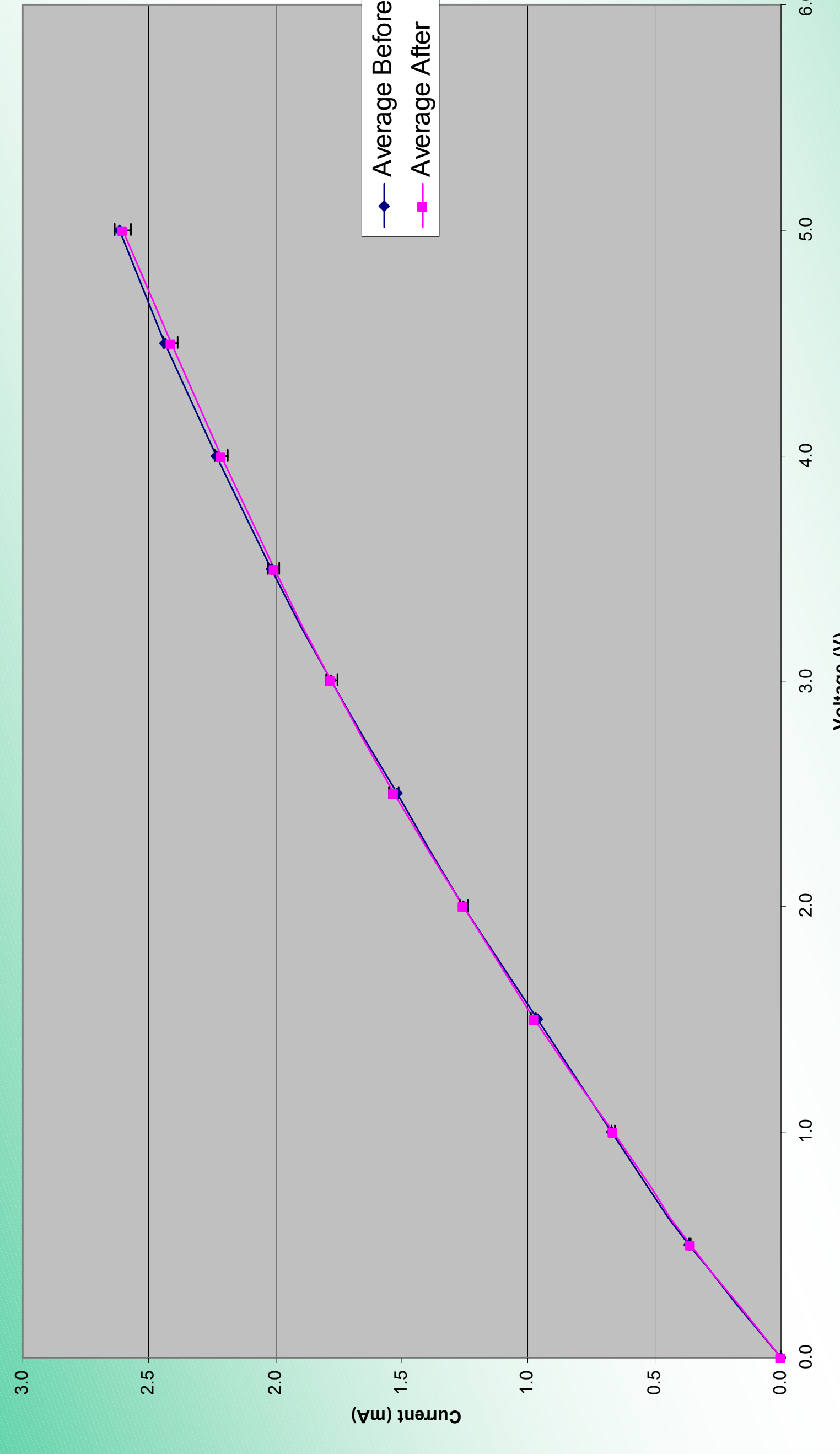


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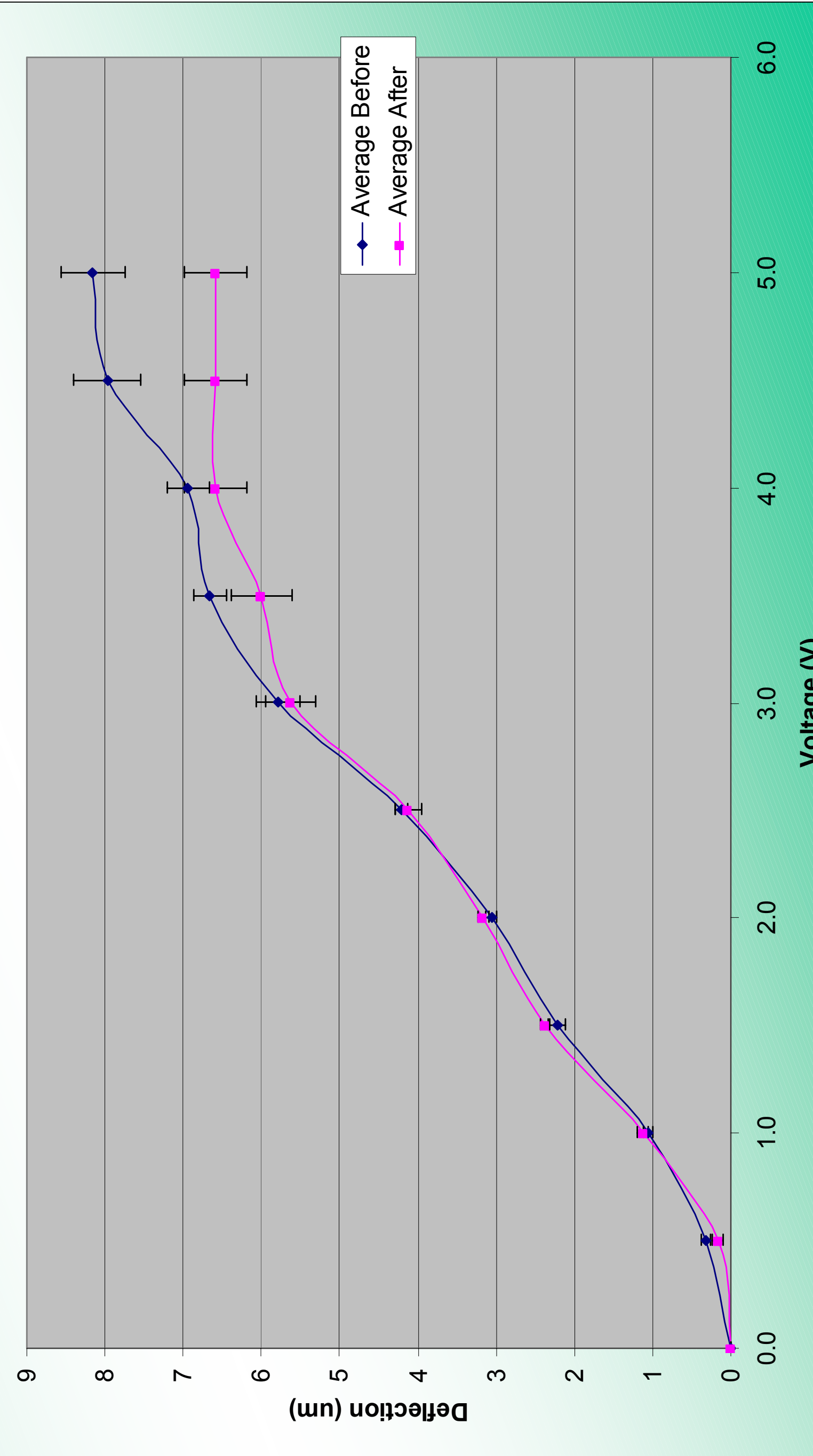


Dose of 10^{13} protons cm^{-2}

Current vs. Voltage (Chip 1)

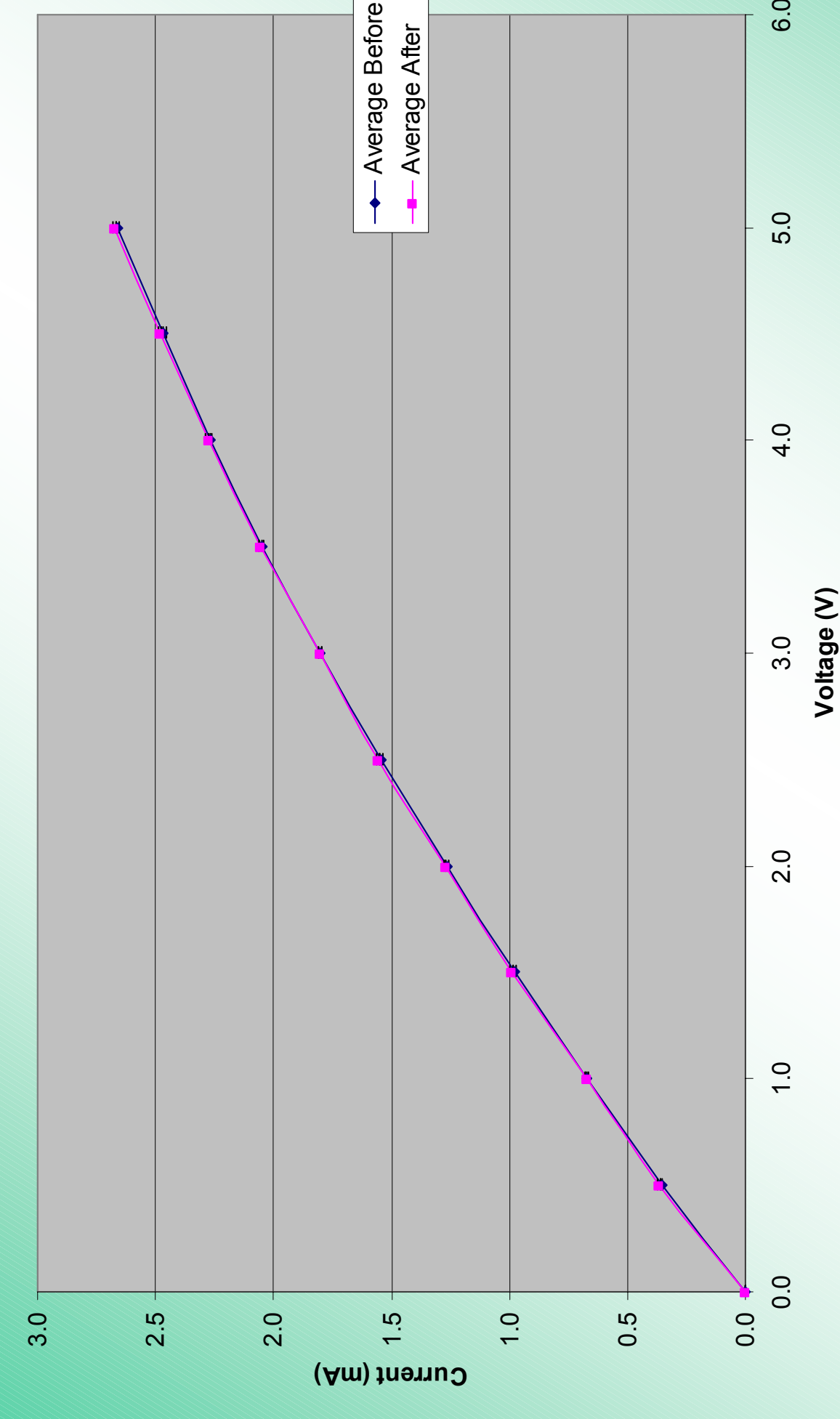


Displacement vs. Voltage (Chip 1)

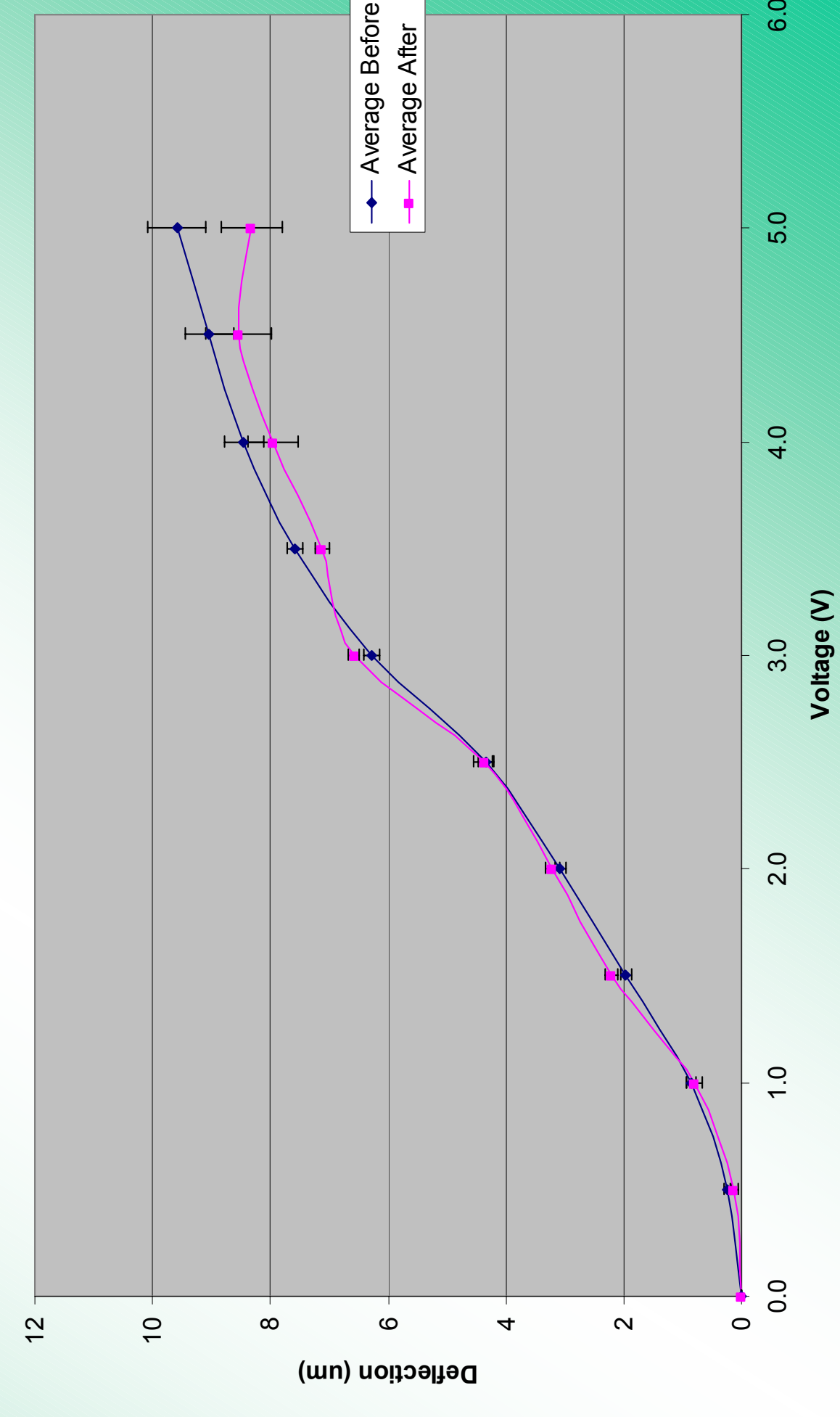


Dose of 10^9 protons cm^{-2}

Current vs. Voltage (Chip 2)

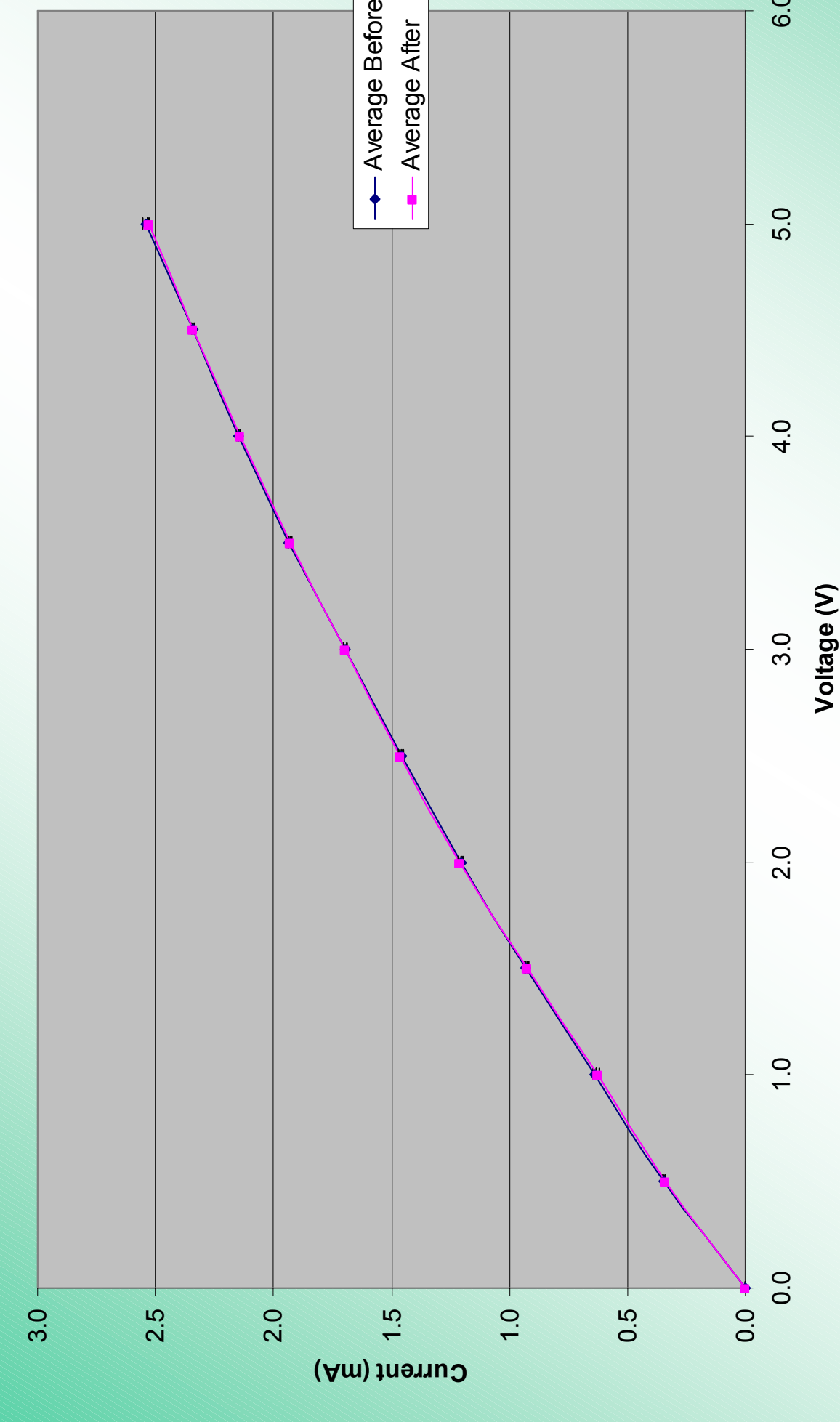


Displacement vs. Voltage (Chip 2)

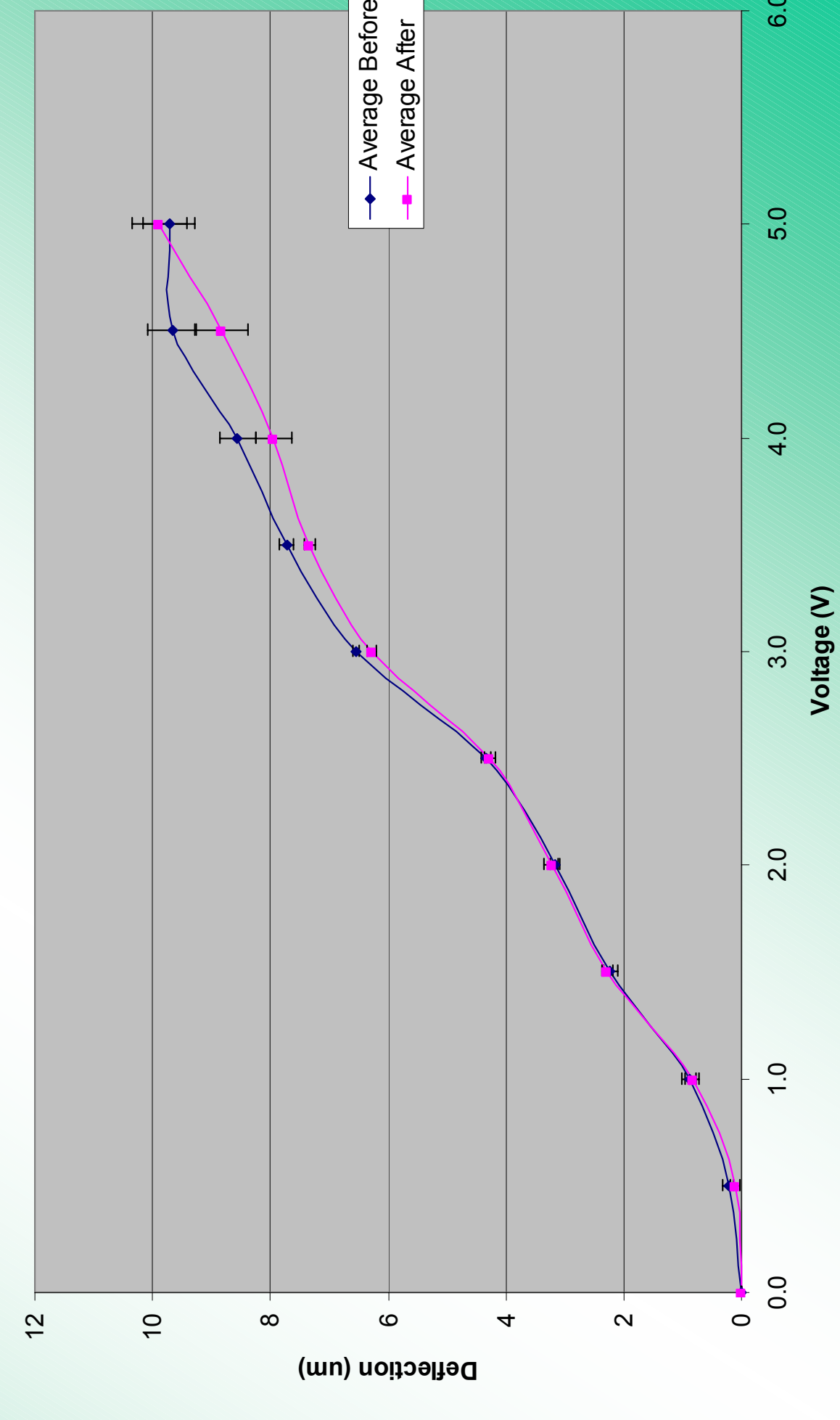


Dose of 10^{10} protons cm^{-2}

Current vs. Voltage (Chip 3)

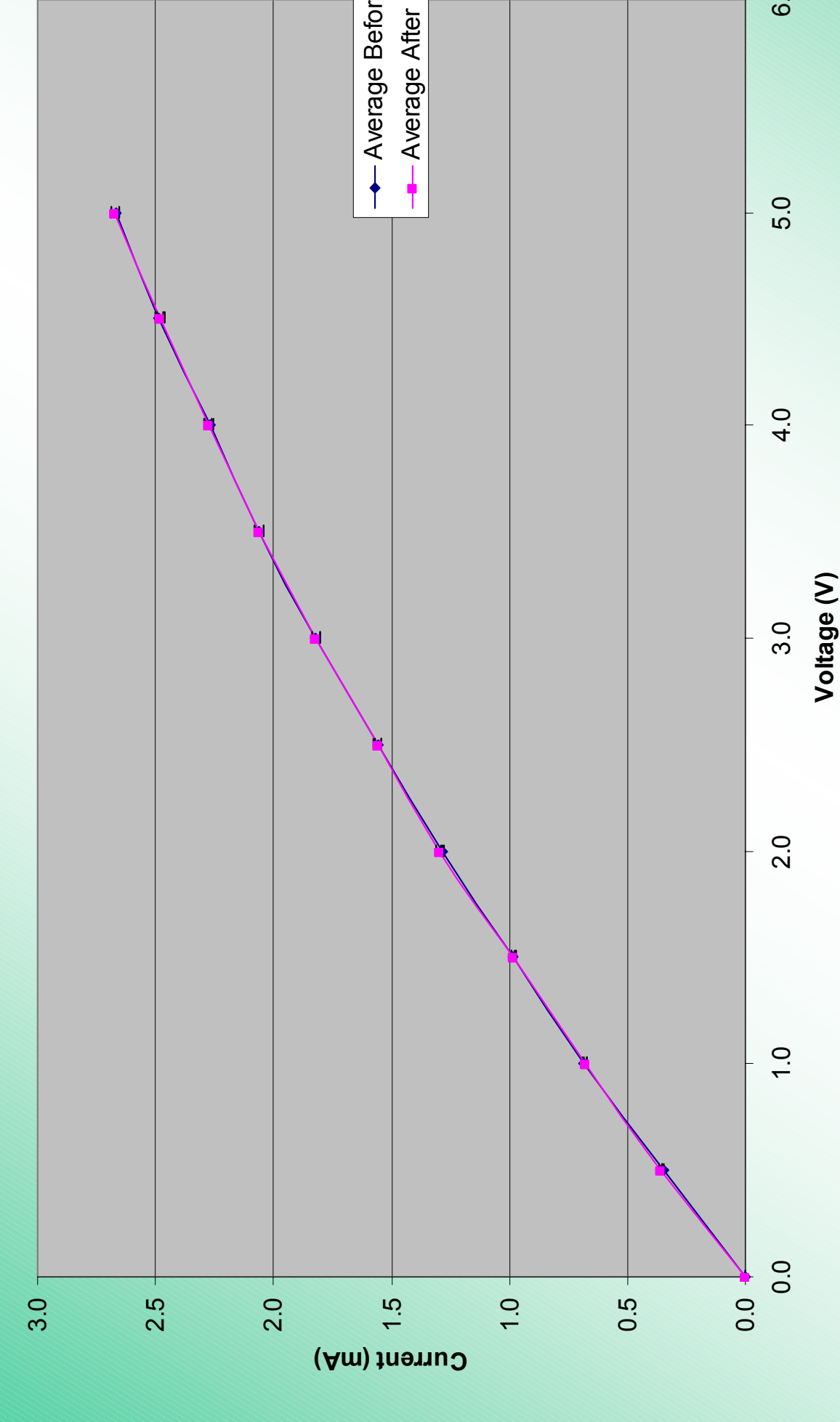


Displacement vs. Voltage (Chip 3)

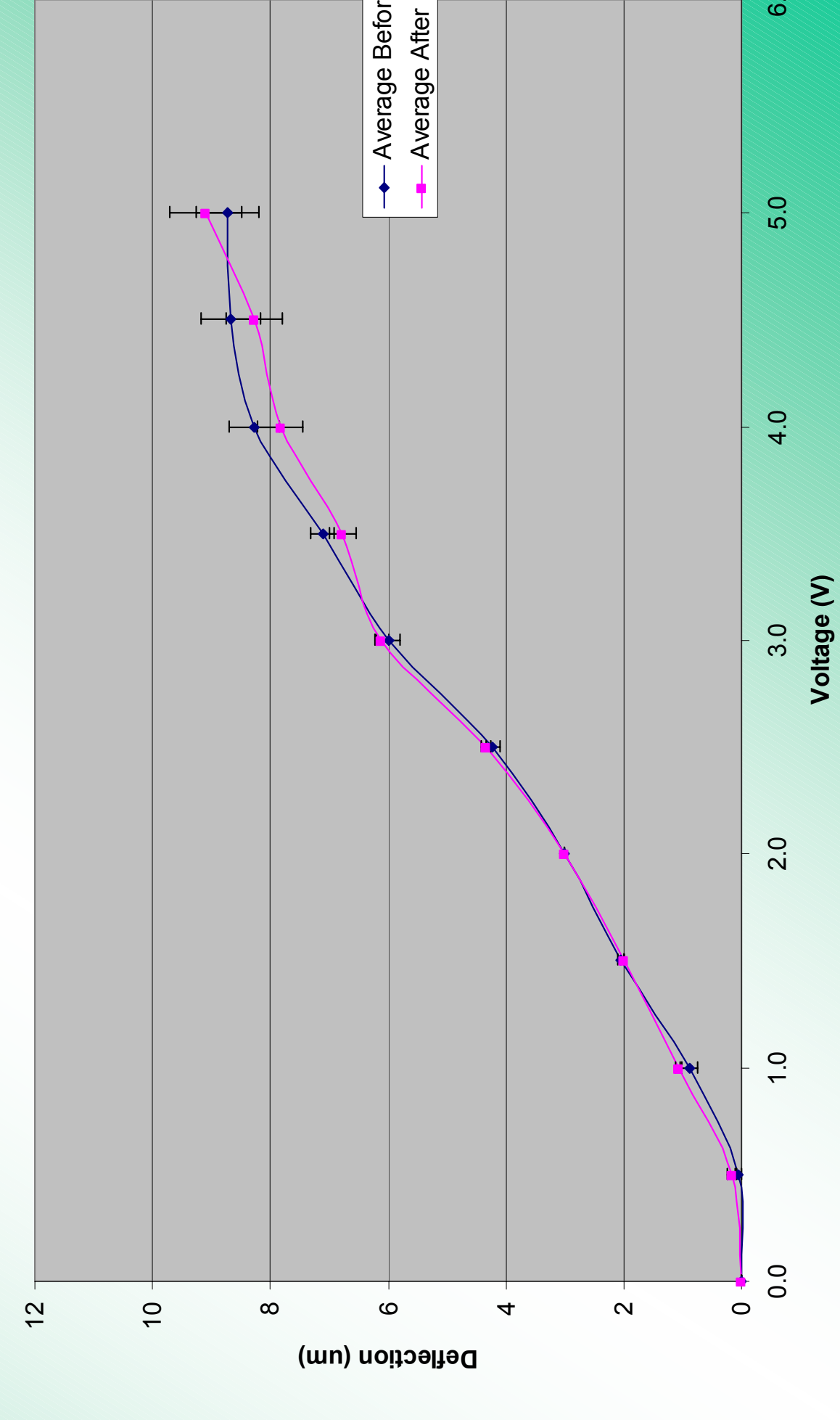


Dose of 10^{11} protons cm^{-2}

Current vs. Voltage (Chip 4)

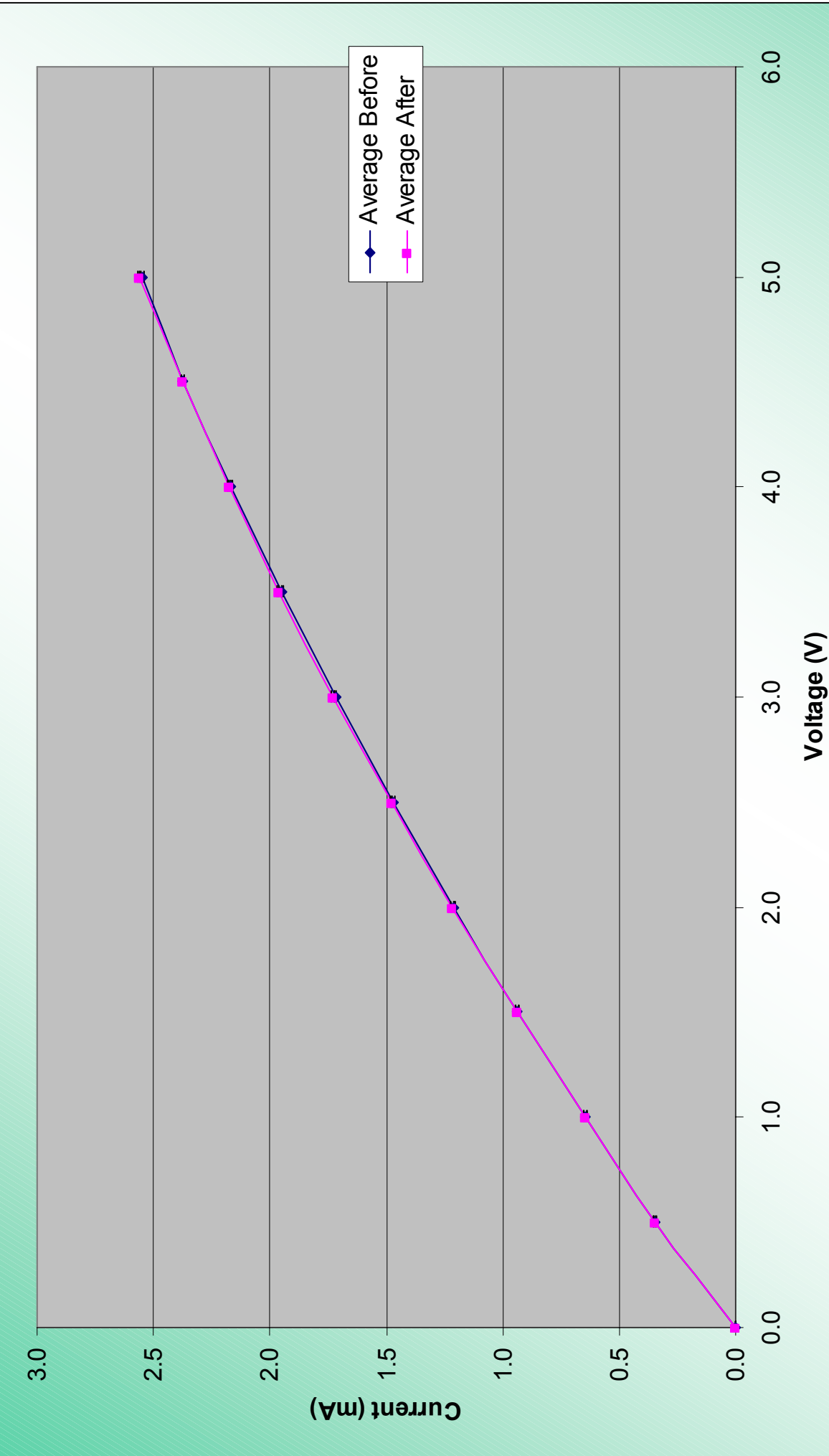


Displacement vs. Voltage (Chip 4)



Dose of 10^{12} protons cm^{-2}

Current vs. Voltage (Chip 5)



Displacement vs. Voltage (Chip 5)

