Hydroloop II: Magnetohydrodynamic Loop

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After the success of the previous Hydroloop model, there were still two major problems that needed solving: a lack of consistency and efficiency, both of which stemmed from the rudimentary concepts of the original Hydroloop. The purpose of this project was to fundamentally change the next model by introducing a new concept: magnetohydrodynamics. Essentially, electromagnetic forces interact to propel water in a certain way without the need for moving parts, with the potential of serving as transportation. This is more efficient as less energy is used, and it increases consistency without the presence of any abnormal movements. What needed to be analyzed though, was the ideal conditions in which this model could operate: the right conductive material and level of salinity. I then built the track out of plastic vinyl sheeting, making it 2” high and wide, and making 12 different MHD stations, each with neodymium magnets and 9V batteries, to have separate areas throughout the track that will continue to propel the water. Three conductive materials and two separate salinity levels were tested, and after analyzing the trials, thin aluminum sheets and a 7.5% salt level were determined ideal for the track. Ultimately, my hypothesis was partially correct, but an observation I made was a large formation of bubbles, which I believe is a waste of energy caused by hydrolysis. A fully developed model however, using a reverse osmosis chamber, stronger magnets, higher amperage, and a way to reinfuse salt to the track, could potentially make this a new viable form of transportation.

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