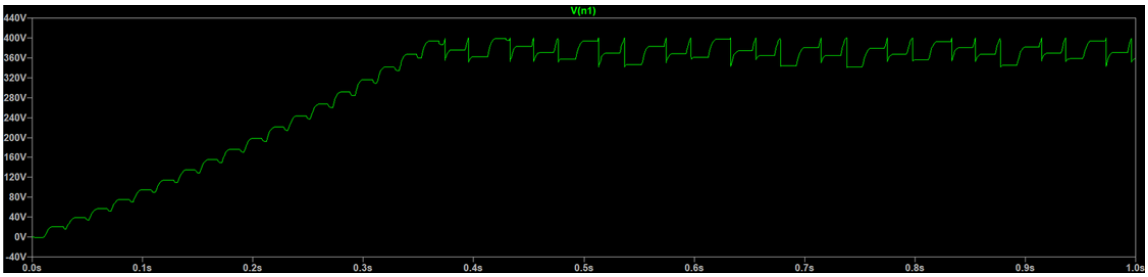
Harvesting energy from a passing car

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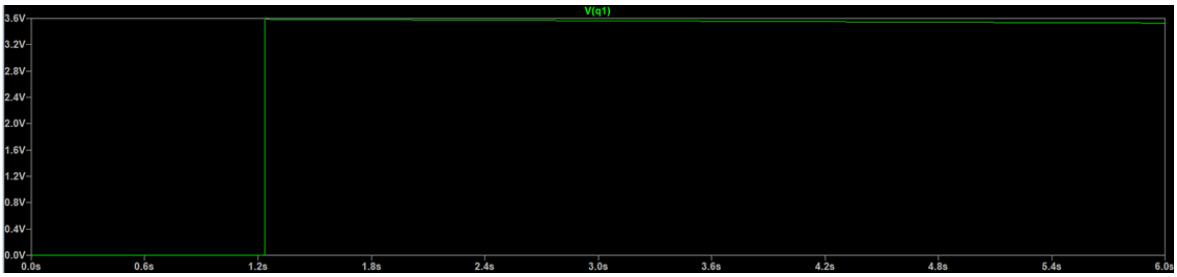
Over four weeks at ESYCOM, I tested and simulated the power-conditioning circuit of a triboelectric nanogenerator. A car wheel pressed on the device. The goal was to harvest enough energy to power a Bluetooth transmitter that could report the vehicle's passage.

Circuit simulation

I modeled the conditioning circuit in LTspice and inspected the simulated voltage at an internal node and at the output. The report compares the transient voltage traces below.



Internal node voltage against time, from the original LTspice simulation.



Output voltage against time, from the same circuit study.

Prototype testing

I used an oscilloscope to inspect the output on the bench. When we tested the device under a vehicle, the wheel dragged the prototype along the ground. Supporting the device on cardboard kept it from sliding during subsequent tests.