Shake Light

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We intend to build a low-cost electrical generator that will utilize the waves commonly found in a lake or stream. The rocking motion of these transverse waves will cause a set of magnets to slip back and forth along a coil of wire, creating electricity by Faraday's law of induction. A realistic generator would need to be corrosion resistant, portable, and inexpensive. If we meet these goals, then it might be possible to make a large number of these non-polluting voltage sources setting them near the shoreline to generate electricity day and night. A section of pipe that was designed to protect the generator, limited the motion of its magnets causing electrical production to disappear. We found during testing and realized we needed to strike a balance between durability and electrical output. This problem was solved by protecting only the magnets. We encased them in a 3" tubular section of Styrofoam that bobbed up and down upon the water while the coils stood relatively still. Our magnetic field of 8.24 mT cut through the copper coils producing an alternating current, whose voltage reached a maximum amplitude of 44 mV. The generator was further improved by increasing the number of coils, wiring in a diode to change the alternating current to direct current, and adding a capacitor to store the energy. We have so far achieved a voltage of 121 mV with 4" amplitude waves moving across the device at a rate of 1 wave/sec. Many other enhancements are possible.