

Abstract Submitted
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Tesla's fluidic diode exploits early turbulence and pulsatile flows¹

LEIF RISTROPH, QUYNH NGUYEN, New York Univ NYU — Nikola Tesla is known for his ingenious inventions for controlling and transforming electrical currents, but he also dabbled in fluidics or flow control. His design for a no-moving-parts valve or diode is an asymmetric conduit that allows flow to pass more easily in one direction than in reverse. Through extensive experimental tests of this device, we find that its diodic function turns on abruptly by triggering turbulence at unusually low Reynolds numbers. Further, we observe significant boosts in performance for oscillatory or pulsatile flows, which are transformed into one-way flows by a network of diodes. This fluidic analog of AC-to-DC conversion or rectification is a realization of Tesla's vision for the device.

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