

Abstract Submitted
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A New Fourier Model of Traveling Wave Electrophoresis ROBERT CORRELL, JAMES EAKINS, West Virginia University, JAMES VOPAL, West Liberty State College, BOYD EDWARDS, West Virginia University — Traveling-wave electrophoresis is a new method of separating charged analytes using a series of interlaced electrodes with time-varying electric potentials along a microchannel. It potentially offers several potential advantages over conventional electrophoretic devices, including increased separation efficiency and ease of scalability. A better description of the underlying mathematics is required in order to fully optimize this promising technology. As such, a new Fourier model of the electric potential inside the channel is introduced, along with preliminary computational results. This new representation allows for greatly reduced computation time and greater accuracy. Similarities and differences with other models are highlighted, as well as the dependence of the potential on the electrode and channel geometries. The movement of charged particles in response to the potential is examined, with several critical thresholds highlighted.

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