**Dynamics and stability of one-dimensional plasma with periodic
boundary** PANKAJ KUMAR, BRUCE MILLER, Texas Christian University —
We extend the method proposed by Miller and Rouet to formulate analytic so-
lutions for the electric potential and field in a one-dimensional plasma satisfying
periodic boundary conditions. We have also devised an event-driven algorithm to
follow the time evolution of the system and to study its dynamical properties. In
a dynamical system, the presence of positive Lyapunov exponents indicates that
the system is chaotic. Of particular interest is the value of the largest (maximal)
Lyapunov exponent which is usually sufficient to point toward the degree of chaos
in the system. Using our new approach for defining the phase-space distance in
systems with periodic boundary, we have employed our algorithm to find the largest
Lyapunov exponent in the periodic plasma. Results obtained from our algorithm
will be discussed with a view to exploring the dependence of chaotic properties of
the system on its initial state.

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