Ewald Sums for One Dimension BRUCE MILLER, Texas Christian University, JEAN-LOUIS ROUET, Universite d'Orleans — We derive analytic solutions for the potential and field in a one-dimensional system of masses or charges with periodic boundary conditions, in other words Ewald sums for one dimension. We also provide a set of tools for exploring the system evolution and show that it's possible to construct an efficient algorithm for carrying out simulations. In the cosmological setting, we compare two approaches for satisfying periodic boundary conditions, one overly specified and the other completely general. We demonstrate that they provide a nearly identical clustering evolution until the number of clusters becomes small, at which time the influence of any size-dependent boundary cannot be ignored. Finally we compare the results with other recent work with the hope of providing clarification over differences these issues have induced. We explain that modern formulations of physics require a well defined potential which is not available if the forces are screened directly.

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