1135-65-1556 **Eliza Woolworth Matt*** (ewm1@williams.edu), 39 Chapin Hall Drive, Williamstown, MA 01267, and **Julia Vasile** (julia.vasile@stonybrook.edu) and **Philip de Castro** (pdecastr@poets.whittier.edu). *Optimizing Sparse Representations of Kinetic Distributions.*

The United States Air Force Research Laboratory uses kinetic simulations to reduce costs in their various research projects, including plasma simulations. When performing these simulations, probabilistic methods are employed to reduce the computational expense of estimating the physical entropy of the system. These techniques introduce an error term in the estimation, which we seek to reduce by developing a more efficient algorithm. We discuss the nature of kinetic simulations, relevant mathematical background, and methods for error analysis. We then present multiple algorithms to estimate the physical entropy from common sampling distributions. Some techniques explore the use of Binary Trees and the roots of Legendre polynomials, as well as a combination of the two. Finally, we discuss the performance of these algorithms and provide suggestions for further research. (Received September 23, 2017)