Plasma Physics Simulations on Next Generation Platforms AL-
ICE KONIGES, Lawrence Berkeley National Laboratory — The current high-
performance computing revolution provides opportunity for major increases in com-
putational power over the next several years, if it can be harnessed. This transition
from simply increasing the single-processor and network performance to a different
architectural paradigms forces application programmers to rethink the basic models
of parallel programming from both the language and problem division standpoints.
One of the major computing facilities available to researchers in fusion energy is the
National Energy Research Scientific Computing Center. As the mission computing
center for DOE, Office of Science, NERSC is tasked with helping users to overcome
the challenges of this revolution both through the use of new parallel constructs
and languages and also by enabling a broader user community to take advantage
of multi-core performance. We discuss the programming model challenges facing
researchers in fusion and plasma physics in for a variety of simulations ranging from
particle-in-cell to fluid-gyrokinetic and MHD models.

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