Performance of the UCAN2 Gyrokinetic Particle In Cell (PIC) Code on Two Massively Parallel Mainframes with Intel "Sandy Bridge" Processors[1] JEAN-NOEL LEBOEUF, University of Alaska, Fairbanks, AK, USA, VIKTOR DECYK, University of California, Los Angeles, CA, USA, DAVID NEWMAN, University of Alaska, Fairbanks, AK, USA, RAUL SANCHEZ, Universidad Carlos III, Madrid, Spain — The massively parallel, 2D domain-decomposed, nonlinear, 3D, toroidal, electrostatic, gyrokinetic, Particle in Cell (PIC), Cartesian geometry UCAN2 code, with particle ions and adiabatic electrons, has been ported to two emerging mainframes. These two computers, one at NERSC in the US built by Cray named Edison and the other at the Barcelona Supercomputer Center (BSC) in Spain built by IBM named MareNostrum III (MNIII) just happen to share the same Intel "Sandy Bridge" processors. The successful port of UCAN2 to MNIII which came online first has enabled us to be up and running efficiently in record time on Edison. Overall, the performance of UCAN2 on Edison is superior to that on MNIII, particularly at large numbers of processors (>1024) for the same Intel IFORT compiler. This appears to be due to different MPI modules (OpenMPI on MNIII and MPICH2 on Edison) and different interconnection networks (Infiniband on MNIII and Cray's Aries on Edison) on the two mainframes. Details of these ports and comparative benchmarks are presented.

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