Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Deployment of the OSIRIS EM-PIC code on the Intel Knights Landing architecture[1] RICARDO FONSECA, ISCTE-IUL — Electromagnetic particle-in-cell (EM-PIC) codes such as OSIRIS [1] have found widespread use in modelling the highly nonlinear and kinetic processes that occur in several relevant plasma physics scenarios, ranging from astrophysical settings to high-intensity laser plasma interaction. Being computationally intensive, these codes require large scale HPC systems, and a continuous effort in adapting the algorithm to new hardware and computing paradigms. In this work, we report on our efforts on deploying the OSIRIS code on the new Intel Knights Landing (KNL) architecture. Unlike the previous generation (Knights Corner), these boards are standalone systems, and introduce several new features, include the new AVX-512 instructions and on-package MCDRAM. We will focus on the parallelization and vectorization strategies followed, as well as memory management, and present a detailed performance evaluation of code performance in comparison with the CPU code. [1] R. A. Fonseca et al., Lecture Notes in Computer Science **2331**, 342-351 (2002)

[1]This work was partially supported by Fundao para a Cincia e Tecnologia (FCT), Portugal, through grant no. PTDC/FIS-PLA/2940/2014

Ricardo Fonseca
ISCTE-IUL

Date submitted: 14 Jul 2017 Electronic form version 1.4