

## OSIRIS EM-PIC performance tests on Intel KNL systems

R. A. Fonseca

<sup>1</sup> *ISCTE - Instituto Universitário de Lisboa, Lisboa, Portugal*

<sup>2</sup> *IPFN - Instituto de Plasmas e Fusão Nuclear, Lisboa, Portugal*

Intel Knights Landing (KNL) systems present a new computing paradigm for large scale computations, currently (November 2017) occupying 3 slots of the top 10 HPC sites list (<http://top500.org>). These systems present a new challenge for physics codes, and in particular for electromagnetic particle-in-cell (EM-PIC) codes such as OSIRIS [1], requiring a continuous effort in adapting the algorithm to the new hardware and computing paradigms. In this work, we report on our efforts on the use of OSIRIS code on KNL systems for production runs, focusing on the code performance on 1D, 2D and 3D geometries, in single in double precision. We will discuss on the parallelization and vectorization strategies followed, the use of specialized hardware features, as well as the parallel scalability of the code on multiple KNL nodes.

This work was partially supported by Fundação para a Ciência e Tecnologia (FCT), Portugal, through grant no. PTDC/FIS-PLA/2940/2014.

### References

[1] R. A. Fonseca et al., *Lecture Notes in Computer Science* **2331**, 342-351 (2002)