PIConGPU on all Platforms & XFEL-Plasma Modeling

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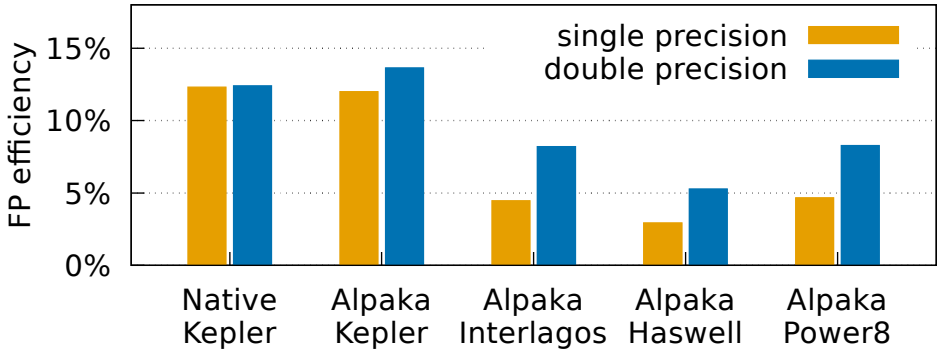
- *Got no GPUs?* Now runs also on: **CPU, KNL, ARM, Power, ...!**
- **open** software stack towards exascale **3D3V PIC** simulations
- **single-source**, performance portable C++ (27k LOC)



- 1^{st} - 4^{th} order, ionization physics, RR, photons, merging, ...
- in situ virtual detectors, **PByte**-scale I/O

Model 1	Model 2
K^2L^7	Model 1+
$K^2L^6 + n$	$K^1L^6M^1 + n$
$K^2L^5M^1 + n$	
$K^1L^7 + n$	
$K^2L^8M^4$	Model 1 +
$K^2L^8M^3 + n$	$K^2L^7M^4 + n$

FLYlite

$$\frac{d\tilde{n}}{dt} = \underline{\mathbf{R}} \cdot \tilde{n}$$

A. Huebl et al. (2015), DOI:10.5281/zenodo.33624; E. Zenker et al. (2016), DOI:10.1109/IPDPSW.2016.50; A. Matthes et al. (2016), DOI:10.14529/jsfi16040 A. Huebl et al. (2017), *in-press*, arXiv:1706.00522; A. Matthes et al. (2017), *in-press*, arXiv:1706.10086; H.-K. Chung et al. (2005,2007), HEDP 1&3

Upcoming: Non-LTE Atomic Physics

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