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Exascale simulations of laser plasma accelerators with PIConGPU

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Exascale simulation capabalities are now available for studying laser plasma accelerators using realistic laser and plasma descriptions and providing quantitative predictions. We present recent advances in modeling LPA at large scales for both electron and ion acceleration. We specifically discuss workflows for comparison to experiments and evaluate predictive capabilities. The role of reliable simulation data for the community and its use to ease modeling using machine learning will be discussed.

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