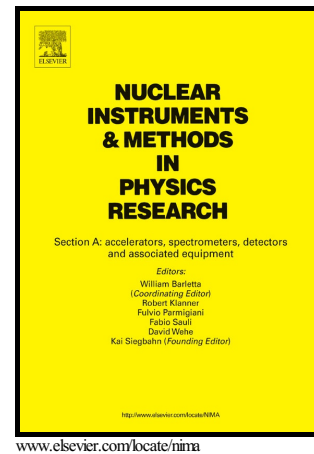


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PII: S0168-9002(16)30023-7
DOI: <http://dx.doi.org/10.1016/j.nima.2016.03.005>
Reference: NIMA58672

To appear in: *Nuclear Inst. and Methods in Physics Research, A*

Received date: 13 November 2015
Revised date: 26 January 2016
Accepted date: 1 March 2016

Cite this article as: A. Marocchino, F. Massimo, A.R. Rossi, E. Chiadroni and M. Ferrario, Efficient modeling of Plasma Wakefield Acceleration in Quasi-non-linear-regimes with the Hybrid code Architect, *Nuclear Inst. and Methods in Physics Research, A*, <http://dx.doi.org/10.1016/j.nima.2016.03.005>

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Efficient modeling of Plasma Wakefield Acceleration in Quasi-non-linear-regimes with the Hybrid code Architect

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Abstract

In this paper we present a hybrid approach aiming to assess feasible plasma wakefield acceleration working points with reduced computation resources. The growing interest for plasma wakefield acceleration and especially the need to control with increasing precision the quality of the accelerated bunch demands for more accurate and faster simulations. Particle in cell codes are the state of art technique to simulate the underlying physics, however the run-time represents the major drawback. *Architect* is a hybrid code that treats the bunch kinetically and the background electron plasma as a fluid, initialising bunches in vacuum so to take into account for the transition from vacuum to plasma. Architect solves directly the Maxwell's equations on a Yee lattice. Such an approach allows to drastically reduce run time without loss of generality or accuracy up to the weakly non linear regime.

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