

Particle Dynamics in Laser Wakefield Acceleration

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We present charged particle dynamics in the bubble region of laser driven wake field acceleration. A simple model is developed and presented alongside models that have been developed for actual experimentation. Our assumptions are characterized as perturbations and tested against conditions of validity so that we may compare the accuracy of the model against the expected outcome of the experimental models.

Homework 10 paired project question: Determine an existing model that is capable of being simplified for our purposes. We will brainstorm a list of sources that could be useful for the project. We will independently read and understand each source. To keep the project focused, we will discuss what is worth implementing into our model.

Homework 11 paired project question: Develop a simple model for quasi-static background charge (using Python) based on sources from the week before.

Homework 11 paired project question: Develop a model for a time-dependant electromagnetic field associated with an ultra short laser pulse. We will meet and work on the coding together for the Homework 11 paired project question.

Homework 12 paired project question: Characterize our assumptions and form a set of validity conditions.

Homework 12 paired project question and later: Compare our simulated dynamics with the predicted motion of the experimental model using our conditions of validity. Produce results for homework 12. Again, we will meet and work on the coding together.

Homework 13 paired project question: Meet up to discuss how to effectively organize our poster and finish producing results.