

1. Record Nr.	UNINA9910908381503321
Autore	Hagedorn Melinda
Titolo	Minimization Problems for the Witness Beam in Relativistic Plasma Cavities // by Melinda Hagedorn
Pubbl/distr/stampa	Wiesbaden : , : Springer Fachmedien Wiesbaden : , : Imprint : Springer Spektrum, , 2024
ISBN	9783658462260 9783658462253
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (81 pages)
Collana	BestMasters, , 2625-3615
Disciplina	539.73
Soggetti	Particle accelerators Plasma (Ionized gases) Plasma accelerators Mathematical optimization Accelerator Physics Plasma Physics Plasma-based Accelerators Optimization
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Preparation -- Wakefield acceleration -- Discussion of some Optimization Algorithms -- Numerical Simulations -- Conclusion and Outlook.
Sommario/riassunto	This thesis deals with an optimization problem from the field of theoretical plasma physics. Specifically, it deals with the question of how the accelerated electrons are spatially arranged in a plasma wave generated by a laser pulse. An internal structure of this so-called witness beam is of interest for the radiation characteristics of such electron beams, in particular with regard to the coherence of the generated radiation. The resulting internal structure of the electron beam is a result of the interaction of the electrons with each other and the electric fields of the wakefield, therefore it is determined by solving a minimization problem. The thesis builds on previous results in this field and aims to find suggestions for improved algorithms to

determine the minimum sought. About the Author Melinda Hagedorn is a PhD student in Mathematical Optimization, research associate and teaching assistant at Heinrich Heine University in Düsseldorf. She holds master's degrees in mathematics and physics. In her research, she focuses in particular on variants of the stochastic gradient method applied to convex optimization problems.
