Diploma thesis abstract

«Gerchberg-Saxton algorithm: its stability, efficiency and hybridization for beam shaping quality improvement»

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In this work we present the results of the given intensity distribution formation by means of iterative hybrid algorithms. Hybrid algorithms are based on Gerchberg-Saxton algorithm that is combined with local- and global-search algorithms, namely hill-climbing algorithm and genetic algorithm. The Gerchberg-Saxton algorithm is combined with hill-climbing algorithm in two different ways. In the first, so-called "consecutive" hybrid algorithm the Gerchberg-Saxton algorithm is carried out after the implementation of the hill-climbing algorithm. In the second "embedded" a given number of Gerchberg-Saxton algorithm iterations is performed on each iteration of hill-climbing algorithm. The third hybrid algorithm is based on consecutive execution of Gerchberg-Saxton algorithm after the implementation of genetic algorithm. High efficiency and universality of hybrid algorithms in comparison with the mentioned above iterative algorithms applied individually has been proved numerically and experimentally.