



Optimization procedure for migration of DNA molecules

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Abstract. We investigate an optimization procedure for different patterns in biological experiments, in particular, the recent data for migration of DNA (deoxyribonucleic acid) molecules in electrophoresis. We describe the results of experiments, where the mobility of different DNA fragments in electric field was measured in two porous media: in polyacrylamide gel and free solution. We calculate the χ^2 function, that indicates the correspondence between the theoretical and experimental values of five free model parameters $D_1 \dots D_5$, which determine the mobility decrement of DNA fragments. In our optimization procedure we search the absolute minimum of χ^2 in the five-dimensional space of these free parameters D_i^{th} and obtain their optimal values for polyacrylamide gel and free solution. Finally we compare the results of our fitting procedure and the optimal values, used by the authors of the experiment.

Keywords: DNA, electrophoresis, mobility decrement

MSC numbers: 83E15,83F05

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