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Numerical algorithm for optimization of positive electrode in lead-acid batteries

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The positive electrode in lead-acid batteries is one of the most sensitive parts of the battery, that is affected by aggressive chemical processes during its life. Therefore, an optimal design of the positive electrode of the battery may have as effect a dramatic improvement of the properties of the battery - such as total capacity or endurance during its life. Numerical optimization of electrodes covers a range of rather complex tasks, from the analysis of the graphical representation of the current distribution to numerical solution of differential equations. We integrate all these in a software package that can be used for the development of optimized electrodes. We present the principles of our analysis as well as several guiding rules to be used for the electrode's design.

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