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28. Juli 2016

Einladung zum Vortrag

von

Oleg Birkholz
Karlsruhe Institute of Technology

Modeling electrode structures of lithium-ion batteries using the Discrete-Element-Method

The performance of lithium-ion batteries is strongly influenced by the composition and fabrication of the electrode structures. On the one hand, the used material and its microstructure plays an important role. On the other hand, the mechanical densification processes, such as calendering or sintering, impact on the quality of the battery.

Modeling electrode structures can be done in the following steps. First, the Random-Close-Packing algorithm delivers random, densely packed and overlap free assemblies of spherical shapes, which may consist of different phases. Second, the Discrete-Element-Method is used for both densification of the assemblies by imposing uniaxial compression load as well as monitoring the intercalation induced stresses inside the structure. Densification can alternatively be modeled by so-called numerical sintering. Third, percolated clusters, which form pathways through the electrode, can now be identified by a modified Hoshen-Koppelman algorithm. Finally, the structure can be represented via a Resistor-Network and - by solving the resulting system of linear equations - an effective conductivity can be calculated to evaluate the performance of the given electrode structure.

Termin: **Montag, 12. September 2016, 10:00 Uhr**

Ort: **Universität Ulm, Helmholtzstr. 22, Raum 2.02**

Der Vortrag findet im Rahmen des Forschungsseminars des Institutes für Stochastik statt.
Alle Interessenten sind herzlich eingeladen.

gez. V. Schmidt