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Integrating Advanced Imaging Techniques and Multiscale Electrochemical Modeling to Determine Effective Lithium-Ion Transport Properties

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The Bruggeman model is often used to calculate effective properties of batteries. Yet, the theory relies on a simplified representation of the pore-scale structure. Access to detailed topological information of battery electrodes by means of Tomography and Scanning Electron Microscope images provides new opportunities to more accurately estimate effective parameters. We propose a computational framework which combines advanced imaging techniques and homogenization theory to estimate effective conductivity of battery electrodes while accounting for full topological information at the pore-scale.

References

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