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A new battery-charging method using an oscillating field: Amplitude and frequency dependence of charging time[1] IBRAHIM ABOU HAMAD, Department of Physics and Center for Materials Research and Technology, Florida State University, M.A. NOVOTNY, Department of Physics & Astronomy and HPC^2, Center for Computational Sciences, Mississippi State University, DAVID WIPF, Department of Chemistry, Mississippi State University, PER ARNE RIKVOLD, Department of Physics and Center for Materials Research and Technology, Florida State University — We propose a new charging method for Lithium-ion batteries, based on large-scale molecular dynamics studies. By applying an additional oscillating field to the constant charging field, one can charge a Lithium-ion battery in a fraction of the time originally needed. The additional field not only increases the diffusion rate, but also enhances intercalation of the Lithium ions into the graphite electrode. Our simulations show an exponential dependance of the Lithium ion intercalation time on the amplitude of the additional oscillating field. The dependence of the charging time or intercalation time on the frequency of the additional field will also be discussed.

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