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# Study of Muon Dynamics in Battery Materials

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An important point of applying the muon to battery studies is understanding the muon dynamics within battery materials. To address this issue, our first target system is  $\text{LiFePO}_4$ . The diffusion of Li-ion directly corresponds to the fluctuation rate of the muon. On the other hand, due to the zero-vibration motion of the muon, the implanted muon also has the probability to diffuse inside the system, which also contributes to the fluctuation rate of the muon. The diffusion of muon and Li-ion inside the system is very sensitive to temperature. How to distinguish the muon and Li-ion diffusion is one of the fundamental problems in battery studies using muon. We are now approaching this problem using density functional theory (DFT) Calculations.

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