On decomposition theorems for closed forms in the non-gradient method

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In the context of the study of hydrodynamic limit, closed forms on an infinite configuration space in a L^2 space are well studied and their characterization theorem plays an essential role if the model is non-gradient. In this talk, I will report that closed forms in the set of local functions can be characterized by a similar way as L^2 functions but its proof is very simple and completely different from that for L^2 functions. With this new observation, we also have an alternative proof of the original characterization theorem in the L^2 space, which does not require the sharp estimate of the spectral gap, for the class of lattice gases that are reversible under the Bernoulli measures. Moreover, we extend these characterization theorems for the models in a crystal lattice from $\mathbb{Z}^d$.