Propositions

of Ph.D. dissertation entitled

Mimetic Spectral Element Method and Extensions toward Higher Computational Efficiency

by

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These propositions are regarded as opposable and defendable, and have been approved as such by the promotor dr.ir. M.I. Gerritsma.

1. Computational physics concerns more mathematics than physics.

2. All numerical methods produce discretization error while a structure-preserving one knows where to do it. †

3. The meaning of a physical variable cannot be complete without taking its geometric aspect into consideration.

4. The approximation in solutions does not necessarily come with the approximation in embedded structures such as conservation laws. †

5. The essence of an object is unique and hidden, and different representations expose different parts ot it.

6. A complicated approach reveals the simplicity of a problem.

7. Some important conservative structures of the Navier-Stokes equations can be well preserved by the mimetic spectral element method. †

8. Hybridization and dual basis functions are efficient tools for the discretization of the double de Rham complex. †

9. Well understanding is a necessary and insufficient condition of well implementing.

10. What to do is more difficult than what not to do.

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†This proposition pertains to this dissertation.