

研究活動 2017年度

出版された論文

- 1) Y. Suzuki, Bracket formulations and energy- and helicity-preserving numerical methods for the three-dimensional vorticity equation, *Comput. Methods Appl. Mech. Engrg.* 317 (2017) 174—225.
- 2) Y. Suzuki, Bracket formulations and energy- and helicity-preserving numerical methods for incompressible two-phase flows, *J. Comput. Phys.* 356 (2018) 64—97.

研究発表

- 1) Y. Suzuki, A GENERIC formalism and the interstitial work flux for Korteweg-type fluids, *International Workshop on the Multi-Phase Flow; Analysis, Modeling and Numerics*, November 28 – December 1, 2017, Tokyo.

研究成果：

非圧縮二相流れに対する diffuse interface model を歪対称の Poisson 括弧と半負定値対称の散逸括弧を用いて定式化した。それに mimetic finite difference 法と離散変分導関数法を適用して、三次元 Euclid 空間上の de Rham 複体の構造を正しく受け継ぐとともに、運動エネルギーとヘリシティが非粘性流れにおいては正確に保存し、粘性流れに対しては適切に散逸する数値解析手法を開発した。

The diffuse interface models for incompressible two-phase flows are formulated within a bracket formalism employing skew-symmetric Poisson brackets and symmetric negative semi-definite dissipative brackets. The mimetic finite difference and the discrete variational derivative method are applied to formulations above to obtain numerical methods which preserve the kinetic energy and helicity in computations for inviscid flows and dissipates them appropriately in computations for viscous flows, as well as inherit the de Rham complex on the three dimensional Euclidean space.