Chenyang Li

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Education

- **East China Normal University** *Sept. 2023-Present*

  Ph.D. student in Computational Mathematics. Shanghai, China

  - **Address:** School of Mathematical Sciences, East China Normal University, Shanghai 200241, China.
  - **Concentration:** Numerical analysis and simulation of incompressible flow coupled with multi-physics fields.
  - **Supervisor:** Haibiao Zheng, Associate Professor, School of Mathematical Sciences and Shanghai Key Laboratory of Pure Mathematics and Mathematical Practice, East China Normal University, Shanghai 200241,China.

- **Wenzhou University** *Sept. 2020-Jul. 2023*

  M.S. in Computational Mathematics. Wenzhou, China

  - **Address:** College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.
  - **Concentration:** Finite element discretizations for incompressible flow with variable density.
  - **Dissertation:** Research on the first-order Euler finite element algorithm for two-dimensional variable density MHD system.
  - **Supervisor:** Yuan Li (Associate Professor) &. Rong An (Professor). College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.

- **Zhejiang Ocean University** *Sept. 2016-Jul. 2020*

  B.S. in Mathematics and Applied Mathematics (Normal Major). Zhoushan, China

  - **Address:** School of Information Engineering, Zhejiang Ocean University, Zhoushan 316000, China.
  - **Dissertation:** The integration of mathematical modeling concepts into secondary school mathematics.

Personal Information

- **Date of Birth:** October 4, 1999.
- **Nationality:** China.

Research Interests

Computational fluid dynamics, Numerical solution of partial dierential equations (PDEs), Finite element methods, Stabilized mixed finite element methods. Numerical analysis and simulation of **the time-dependent coupling model** including Navier-Stokes equation, Stokes-Darcy System, Natural Convection Model, Magnetohydrodynamics (MHD) System, Chemotaxis–Navier-Stokes System. **The time-dependent coupling model with variable density** including Navier-Stokes Equation with variable density, Natural Convection Model with variable density, Magnetohydrodynamics System with variable density, Ericksen-Leslie system with variable density.

Technical skills

- **Programming:** FreeFem++, TecPlot, Paraview, Matlab, LaTeX, Fenics.
- **Writing:** Research manuscripts, funding proposals.

Research Experience

[1] Algorithm study of the incompressible magnetohydrodynamic equations with variable density in 2D. Xinmiao Talents Program of Zhejiang Province, **Principal Investigator (P.I.)**, Fiscal Year 2022-2024.

[2] Convergence analysis of finite element discrete scheme for the incompressible magnetohydrodynamics system with variable density. the Master's Innovation Foundation of Wenzhou University. **Principal Investigator (P.I.)**, Fiscal Year 2022-2023.

[3] Error analysis of first-order Euler linearized finite element scheme for the 2D magnetohydrodynamics system with variable density. The Innovation Foundation of Wangxiaoan in Wenzhou University, **Principal Investigator (P.I.)**, Fiscal Year 2022-2023.

[4] Blow up and Existence of the solutions for biological chemotaxis models. The Innovation Foundation of Zhejiang Ocean University. **Principal Investigator (P.I.)**, Fiscal Year 2018-2019.

Honors and Awards

• Graduate Academic Scholarship, East China Normal University, Shanghai, China. 2023-2024

• Outstanding Graduates of Zhejiang Province, Wenzhou, China. 2023. June.

• Outstanding Graduates of Zhejiang Ocean University, Zhoushan, China. 2020. June.

Refereed Journal Publications and Ongoing Works

[1] **Chenyang Li**, Yuan Li. Optimal L2 error analysis of first-order Euler linearized finite element scheme for the 2D magnetohydrodynamics system with variable density. Computers and Mathematics with Applications 128 (2022): 96-107.

[2] Yuan Li, **Chenyang Li**, Xuewei Cui. Spatial error analysis of a new Euler finite element scheme for the incompressible flows with variable density. Submitted.

[3] **Chenyang Li**, Haibiao Zheng. Temporal error analysis of a BDF2 time-discrete scheme for the incompressible Navier-Stokes equations with variable density. Journal of Computational and Applied Mathematics. Submitted.

[4] Atrout Sabah, Md. Abdullah Al Mahbub, **Chenyang Li**, and Haibiao Zheng. Eicient and Long-Time Accurate Second-Order Decoupled Method for the Blood Solute Dynamics Model. International Journal of Numerical Analysis and Modeling. Submitted.

[5] **Chenyang Li**. Error analysis of a Euler finite element scheme for Natural convection model with variable density. https://doi.org/10.48550/arXiv.2504.04381.

[6] **Chenyang Li**. Error Estimate of a linearized Second-order Fully Discrete Finite Element Method for the bioconvection flows with concentration dependent viscosity. https://doi.org/10.48550/arXiv.2504.04357.

[7] **Chenyang Li** , Chunchi Liu, Yizhong Sun, Haibiao Zheng. Error estimate of parallel decoupled stabilized finite element algorithm for the fully mixed Stokes-Darcy Problems. Under Preparation.

[8] **Chenyang Li**. Unconditional Convergence Of High-Order Extrapolations Of The Crank-Nicolson, Finite Element Method For the bioconvection flows with concentration dependent viscosity. Under Preparation.

[9] **Chenyang Li**, Yuze Lu. Unconditional convergence and optimal L2 error estimates of the Crank–Nicolson extrapolation FEM for the nonstationary Navier–Stokes equations. Under Preparation.

REFERENCES

1. **Haibiao Zheng**
   Associate Professor, School of Mathematical Sciences and Shanghai Key Laboratory of Pure Mathematics and Mathematical Practice, East China Normal University, Shanghai 200241,China.
   Email: hbzheng@math.ecnu.edu.cn
   Relationship: Ph.D. Advisor.

2. **Yuan Li**
   Associate Professor, College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.
   Email: liyuan@wzu.edu.cn
   Relationship: M. S. Advisor.

3. **Rong An**
   Professor, College of Mathematics and Physics, Wenzhou University, Wenzhou 325035, China.
   Email: anrong@wzu.edu.cn
   Relationship: M. S. Advisor.