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EDUCATION

Ph.D. in Computational and Applied Mathematics, the University of Texas at Austin
2006 - 2010

◇ Advisor: Leszek Demkowicz, Serge Prudhomme
M.S. in Mathematics, University of Alabama in Huntsville 2005 - 2006
B.S. in Mathematics, Shanghai Normal University 1996 - 2000

EMPLOYMENT

Associate Professor July 2018 - present
Department of Mathematics, City University of Hong Kong
Assistant Professor August 2012 - June 2018
Department of Mathematics, City University of Hong Kong
IMA Postdoctoral associate 2010 - 2012
Institute for Mathematics and its applications, University of Minnesota, Minneapolis
◇ Mentor: Bernardo Cockburn

RESEARCH INTEREST

Numerical analysis, discontinuous Galerkin methods, time-harmonic problems with high wave number, fully nonlinear PDEs

GRANTS

◇ RGC GRF-11302219 “Hybridizable Discontinuous Galerkin Approximation for Second Order Elliptic Operator in Non-divergence Form and Some Applications”, PI, 2020-2022
◇ RGC GRF-11304017 “Hybridizable discontinuous Galerkin approximation of the Maxwell operator and some applications”, PI, 2018-2020
◇ RGC GRF-11302014 “New HDG methods for fluid dynamics and continuum mechanics”, PI, 2015-2018
◇ RGC ECS-109713 “Discontinuous Petrov-Galerkin Methods for Partial Differential Equations with Singular Perturbation”, PI, 2014-2016
◇ CityU SRG-7200324 “Discontinuous Petrov-Galerkin Methods for Partial Differential Equations”, PI, 2013-2015

PUBLICATIONS

Peer Refereed Journals (under review):

1. B. LI AND W. QIU (202x). Convergent post-processed discontinuous Galerkin method for incompressible flow with variable density. submitted.
2. H. CHEN, W. QIU AND A. PANI (202x). A mixed finite element scheme for biharmonic equation with variable coefficient and von Kármán equations. submitted.

Peer Refereed Journals (published/accepted):

3. W. QIU AND S. ZHANG (202x). Adaptive First-Order System Least-Squares Finite Element Methods for Second Order Elliptic Equations in Non-Divergence Form. *SIAM Journal on Numerical Analysis*, accepted.
4. H. CHEN, J. LI, W. QIU AND C. WANG (202x). A Mixed Finite Element Scheme for Quad-Curl Source and Eigenvalue Problems. *Communications in Computational Physics*, accepted.
5. G. CHEN, W. QIU AND L. XU (202x). Analysis of a mixed finite element method for the quad-curl problem. *IMA Journal of Numerical Analysis*, accepted.
6. W. QIU AND K. SHI (2020). Analysis of a semi-implicit structure-preserving finite element method for the nonstationary incompressible Magnetohydrodynamics equations. *Computers and Mathematics with Applications*, 80(10), 2150-2161.
7. W. QIU AND L. TANG (2020). A note on the Monge-Ampère type equations with general source terms. *Mathematics of Computation*, 89(326), 2675-2706.
8. W. QIU AND L. TANG (2020). On a class of generalized Monge-Ampère type equations. *Communications in Contemporary Mathematics*, 22(5).
9. W. QIU AND K. SHI (2020). A Mixed DG method and an HDG method for incompressible magnetohydrodynamics. *IMA Journal of Numerical Analysis*, 40(2), 1356-1389.
10. K. HU, W. QIU, K. SHI (2020). Convergence of a B-E based finite element method for MHD models on Lipschitz domains. *Journal of Computational and Applied Mathematics*, 368, 145-162.
11. W. QIU AND K. SHI (2019). Analysis on an HDG method for the p -Laplacian equations. *Journal of Scientific Computing*, 80, 1019-1032.
12. H. GAO AND W. QIU (2019). A semi-implicit energy conserving finite element method for the dynamical incompressible magnetohydrodynamics equations. *Computer Methods in Applied Mechanics and Engineering*, 346, 982-1001.
13. G FU, Y. JIN* AND W. QIU (2019). Parameter-free superconvergent $H(\text{div})$ -conforming HDG methods for the Brinkman equations. *IMA Journal of Numerical Analysis*, 39(6), 957-982.
14. B. COCKBURN, G. FU AND W. QIU (2018). Discrete H^1 -inequalities for spaces admitting M-decompositions. *SIAM Journal on Numerical Analysis*, 56(6), 3407-3429..

* Denotes a student co-author under my supervision

15. H. GAO AND W. QIU (2018). Error analysis of mixed finite element methods for nonlinear parabolic equations. *Journal of Scientific Computing*, 77, 1660-1678.
16. H. CHEN, W. QIU AND K. SHI (2018). A priori and computable a posteriori error estimates for an HDG method for the coercive Maxwell equations. *Computer Methods in Applied Mechanics and Engineering*, 333, 287-310.
17. W. QIU, J. SHEN AND K. SHI (2018). An HDG method for linear elasticity with strong symmetric stresses. *Mathematics of Computation*, 87(309), 69-93.
18. B. COCKBURN, G. FU AND W. QIU (2017). A note on the devising of superconvergent HDG methods for Stokes flow by M-decompositions. *IMA Journal of Numerical Analysis*, 37(2), 730-749.
19. A. CESMELIOGLU, B. COCKBURN AND W. QIU (2017). Analysis of a Hybridizable Discontinuous Galerkin method for the steady-state incompressible Navier-Stokes equations. *Mathematics of Computation*, 86(306), 1643-1670.
20. P. LU, H. CHEN AND W. QIU (2017). An absolutely stable hp -HDG method for the time-harmonic Maxwell equations with high wave number. *Mathematics of Computation*, 86(306), 1553-1577.
21. E.T. CHUNG AND W. QIU (2017). Analysis of a SDG method for the incompressible Navier-Stokes equations. *SIAM Journal on Numerical Analysis*, 55(2), 543-569.
22. H. CHEN, W. QIU, K. SHI AND M. SOLANO (2017). A Superconvergent HDG method for the Maxwell equations. *Journal of Scientific Computing*, 70(3), 1010-1029.
23. H. CHEN AND W. QIU (2017). A first order system least squares method for the Helmholtz equation. *Journal of Computational and Applied Mathematics*, 309, 145-162.
24. W. QIU, M. SOLANO AND P. VEGA (2016). A high order HDG method for curved-interface problems via approximations from straight Triangulations. *Journal of Scientific Computing*, 69(3), 1384-1407.
25. W. QIU AND K. SHI (2016). A superconvergent HDG method for the incompressible Navier-Stokes equations on general polyhedral meshes. *IMA Journal of Numerical Analysis*, 36(4), 1943-1967.
26. W. QIU, M. WANG AND J. ZHANG (2016). Direct computation of stresses in linear elasticity. *Journal of Computational and Applied Mathematics*, 292, 363-368.
27. W. QIU AND K. SHI (2016). An HDG method for convection diffusion equation. *Journal of Scientific Computing*, 66(1), 346-357.
28. H. CHEN, J. LI AND W. QIU (2016). Robust a posteriori error estimates for HDG method for convection-diffusion equations. *IMA Journal of Numerical Analysis*, 36(1), 437-462.
29. Z. WANG, W. QIU, Y. YANG, C.T. LIU (2015). Atomic-size and lattice-distortion effects in newly developed high-entropy alloys with multiple principal elements. *Intermetallics*, 64, 63-69.

30. D. ARNOLD, G. AWANOU AND W. QIU (2015). Mixed finite elements for elasticity on quadrilateral meshes. *Advances in Computational Mathematics*, 41(3), 553-572.
31. G. FU, W. QIU AND W. ZHANG (2015). An analysis of HDG methods for convection-dominated diffusion problems. *ESAIM: Mathematical Modelling and Numerical Analysis*, 49(1), 225-256.
32. H. CHEN, G. FU, J. LI AND W. QIU (2014). First order least squares method with weakly imposed boundary condition for convection dominated diffusion problems. *Computers and Mathematics with Applications*, 68(12), 1635-1652.
33. J. CHAN, J.A. EVANS AND W. QIU (2014). A dual Petrov–Galerkin finite element method for the convection–diffusion equation. *Computers and Mathematics with Applications*, 68(11), 1513-1529.
34. B. COCKBURN, W. QIU AND M. SOLANO (2014). A priori error analysis for HDG methods using extensions from subdomains to achieve boundary conformity. *Mathematics of Computation*, 83(286), 665-699.
35. J. GOPALAKRISHNAN AND W. QIU (2014). An analysis of the practical DPG method. *Mathematics of Computation*, 83(286), 537-552.
36. B. COCKBURN AND W. QIU (2014). Commuting diagrams for the TNT elements on cubes. *Mathematics of Computation*, 83(286), 603-633.
37. J. BRAMWELL, L. DEMKOWICZ, J. GOPALAKRISHNAN AND W. QIU (2012). A locking-free hp DPG method for linear elasticity with symmetric stresses. *Numerische Mathematik*, 122(4), 671-707.
38. B. COCKBURN, W. QIU AND K. SHI (2012). Superconvergent HDG methods on isoparametric elements for second-order elliptic problems. *SIAM Journal on Numerical Analysis*, 50(3), 1417-1432.
39. J. GOPALAKRISHNAN AND W. QIU (2012). Partial expansion of a Lipschitz domain and some applications. *Frontiers of Mathematics in China*, 7(2), 249-272.
40. B. COCKBURN, W. QIU AND K. SHI (2012). Conditions for superconvergence of HDG methods for second-order elliptic problems. *Mathematics of Computation*, 81(279), 1327-1353.
41. W. QIU AND L. DEMKOWICZ (2011). Mixed hp -finite element method for linear elasticity with weakly imposed symmetry: stability analysis. *SIAM Journal on Numerical Analysis*, 49(2), 619-641.
42. W. QIU AND L. DEMKOWICZ (2011). Mixed variable order h -finite element method for linear elasticity with weakly imposed symmetry. Curvilinear elements in 2D. *Computational Methods in Applied Mathematics*, 11(4), 510-539.
43. W. QIU AND L. DEMKOWICZ (2009). Mixed hp -finite element method for linear elasticity with weakly imposed symmetry. *Computer Methods in Applied Mechanics and Engineering*, 198(47), 3682-3701.

44. L. DEMKOWICZ, P. GATTO, W. QIU AND A. JOPLIN (2009). G^1 -interpolation and geometry reconstruction for higher order finite elements. *Computer Methods in Applied Mechanics and Engineering*, 198(13), 1198-1212.
45. S. WU AND W. QIU (2009). Nonlinear transient dynamic analysis by explicit finite element with iterative consistent mass matrix. *Communications in numerical methods in engineering*, 25(3), 201-217.
46. P. YU, W. QIU AND D.Z. PAN (2008). Fast lithography image simulation by exploiting symmetries in lithography systems. *IEEE Transactions on Semiconductor Manufacturing*, 21(4), 638-645.
47. M. FRIEDMAN AND W. QIU (2008). On the location and continuation of Hopf bifurcations in large-scale problems. *International Journal of Bifurcation and Chaos*, 18(5), 1589-1597.