

Majid Malek Jafarian

Address:

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Birjand, Iran
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Education:

Ph. D. , Mechanical Engineering , 9/2000 -- 8/2006
Ferdowsi University of Mashhad, Mashhad, Iran
Department of Mechanical Engineering

Research interests:

- 1- Three-Dimensional Analysis of Bodies at High Angle of Attack
- 2- Comparison of Dissipation Schemes for Three-Dimensional Flows (MADS Model, SCDS Model and CUSP Model).
- 3- Compressible Vorticity Confinement.
- 4- Turbulence Modeling.
- 5- Stability Analysis of Flows.

Thesis title: Investigation of Vortex-Dominant Flows Over Aerodynamic Bodies at High Angles of Attacks with Improvement and Application of Compressible Vorticity Confinement.

CFD experiences:

- Extending a two dimensional compressible code based on Runge-Kutta time stepping solver to three-dimensions.
- Algebraic turbulence modeling especially Baldwin-Lomax and Cebeci-Smith models for flow over a Body at angles of attack at transonic and supersonic speeds.
- Three-dimensional simulation of a complete projectile with fins at angles of attack (multi block solution).
- Investigating of three-dimensional base flow at transonic speeds.
- Extending a two-dimensional matrix dissipation scheme to three-dimensions with Runge-Kutta time stepping codes.
- Unsteady turbulence modeling with various turbulence models.
- Development of compressible vorticity confinement.

M.Sc. , Mechanical Engineering , 9/97 -- 11/99

Ferdowsi University of Mashhad, Mashhad, Iran

Department of Mechanical Engineering

Key courses taken: Continuum Mechanic, Convection Heat Transfer, Advance Mathematics, Advanced Fluid Dynamics, Boundary Layers Theory, Computational Fluid Dynamics I

Thesis title: Numerical Solution of Compressible Navier-Stokes Equations Using Matrix Dissipation and Self Adaptive Grid Generation Schemes.

CFD experiences:

- Numerical dissipation schemes including scalar and matrix dissipation scheme for two-dimensional compressible flows at transonic and supersonic speeds.
- Adaptive grid Schemes especially based on “Nakahashi&Diewert” Scheme.

B.Sc. , Mechanical Engineering , 9/93 -- 7/97

Mashhad University, Mashhad, Iran

Department of Mechanical Engineering

Major area: Thermofluids

Computer Skills:

Operating Systems: WINDOWS family, MS-DOS

Languages: FORTRAN 77, FORTRAN POWER STATION

Softwares: TECPLOT, WWW

MS word processing and spreadsheet softwares

CFD pkgs.: FLUENT

Publications:

Journal Papers (In English):

- 1- Pasandideh Fard M. and Malek Jafarian M., "Full Navier-stokes Computations of supersonic Flows over a Body at high Angles of Attack and Investigation of Crossflow separation," **Scientia Iranica Journal**, Vol. 11, No. 4, pp 339-350, Oct. 2004.
- 2- Malek Jafarian M. and Pasandideh Fard M., "Three Dimensional Transonic Flow Computations over a Projectile and at the Base Region," - **Journal of Aerospace Science and Technology**, Vol. 2, No. 1, pp. 7-14, 2005.
- 3- Esfahani J. A. and Malek Jafarian M., "Entropy Generation Analysis of a Flat Plate Boundary Layer with Various Solution Methods," **Scientia Iranica Journal**, Vol. 12, No. 2, pp 233-240, April 2005.
- 4- Malek Jafarian M. and Pasandideh Fard M., "Development and Application of Compressible Vorticity Confinement," **Scientia Iranica Journal**, Vol. 14, No. 3, pp 251-262, June. 2007.
- 5- Malek Jafarian M. and Pasandideh Fard M., "Development and Application of Compressible Vorticity Confinement for Flows with High Angles of Attack," Accepted for publication to **Aerospace Science Technology Journal**.
- 6- Khaleghi A., Pasandideh Fard M., Malek Jafarian M. and Chung Y.M., "Assessment of Common Turbulence Models Under Conditions of Temporal Acceleration in a Pipe," **Journal of Applied Fluid Mechanics**, Vol. 3, No. 1, January 2010.
- 7- M. R. Mohaghegh and M. Malek-Jafarian, "Comparative analysis of computational methods for periodic transonic flows at low and high frequencies," **Computational Mathematics and Mathematical Physics**, Vol. 50, No. 7, pp. 1278, 2010.
- 8- H. Bagheri-Esfah and M. Malek-Jafarian, "Development of Artificial Dissipation Schemes and Compressible Vorticity Confinement Methods," **Proc. IMechE**, Vol. 225, **Part G: J. Aerospace Engineering**, 2011.
- 9- H. Bagheri-Esfah, M. Malek Jafarian and M. Bagheri-Esfah, "Comparison of Various Compressible Vorticity Confinement Methods and Development Two New Confinement Parameters," **Journal of Applied Fluid Mechanics**, Vol. 5, No. 3, January 2012.
- 10- H. Khazaei, A.R. Teymourtash and M. Malek Jafarian, " Effects of Gas Properties and Geometrical Parameters on Performance of a Vortex Tube," **Scientia Iranica Journal**, Vol. 19, No. 3, pp 454-462, June. 2012.
- 11- Heydari A., Pasandideh Fard M. and Malek Jafarian M., " Investigation of Unsteady Parameters Effects on Aerodynamic Coefficients of Pitching Airfoil Using Coarse Grid Computational Fluid Dynamic," **Scientia Iranica Journal**, Vol. 21, No. 2, June. 2014.
- 12- M. Mohaghegh and M. Malek Jafarian, "Periodic Transonic Flow Simulation Using Fourier-Based Algorithm," **Journal of Mechanical Science and Technology**, Vol. 28, Issue 10, pp 4109-4119, October 2014.

- 13- A. Javadi, M. Pasandideh-Fard and M. Malek-Jafarian, "Analysis of One-Dimensional Inviscid and Two-Dimensional Viscous Flows Using Entropy Preserving Method," **Arabian Journal for Science and Engineering**, Vol. 39, Issue 10, pp 7315-7325, October 2014.
- 14- A. Javadi, M. Pasandideh-Fard and M. Malek-Jafarian, "Modification of $k-\varepsilon$ Turbulent Model Using Kinetic Energy Preserving Method," **Numerical Heat Transfer, Part B: Fundamentals**, Vol. 68, No. 6, pp. 554-577, December 2015
- 15- M. Mohseni and S. M. Malek Jafarian, "Improvement of compressible vorticity confinement method by combining it with vortex feature detection methods," **Journal of Applied Fluid Mechanics**, Vol. 11, No. 5, pp. 1395-1406, 2018.
- 16- M. Mollaei and S. M. Malek Jafarian, "The introduction of the surfing scheme for shock capturing with high-stability and high-speed convergence," **Communications in Nonlinear Science and Numerical Simulation**, Vol. 78, 2019

Journal Papers (In Farsi):

- 1- Kahrom M., Alavie K. and Malek Jafarian M., "*Stability Analysis for Wake Flow behind a Flat Plate*," **Esteghlal Journal of Engineering**, Vol. 24, No. 1, Part 2, Summer 2005, pp 271-282.
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- 3- -
- 4- -

Conference Papers(In English):

- 1 M. Malek Jafarian and M. Pasandideh Fard, "Three-Dimensional Transonic Flow Computations over a Projectile and at the Base Region", **Proceedings of the 9th Asian Congress of Fluid Mechanics**, May, 27-31, 2002, Isfahan, Iran.
- 2 M. M. Jafarian and M. Pasandideh Fard, "Three-Dimensional Matrix Dissipation Model for Calculating of Euler Equations at Transonic Speeds", **Proceedings of 10th Conference of Iranian Society of Mechanical Engineers (ISME)**, May, 2002, Tehran, Iran.
- 3 M. Malek Jafarian and M. Pasandideh Fard, "Full Navier-Stokes Computations of Supersonic Flows over a Body of Revolution at High Angles of Attack and Investigation of Crossflow Separation", **Proceeding of 4th Iranian Aerospace Society Conference**, January, 2003, Tehran, Iran.
- 4 M. P. Fard, M. Salari, M. Mansoor and M. Malek Jafarian, "An Investigation and Comparison of Roe Upwind Methods with CUSP Central Difference Schemes," **Proceeding of the 12th Asian Congress of Fluid Mechanics** 18-21 August 2008, Daejeon, Korea.

- 5 M. P. Fard, A. Heidary and M. Malek Jafarian, "Numerical Analysis of Unsteady Flow Around an Oscillating Airfoil with Moving Structured Adaptive Grid by Using Central and Upwind Schemes," **Proceeding of the Ankara International Aerospace Conference**, 17-19 August 2009, METU, Ankara, Turkey.
- 6 M. P. Fard, A. Khaleghi, M. Mansoor and M. Malek Jafarian, "Numerical Analysis of the Pipeline in Unsteady Turbulence," **Proceeding of the Ankara International Aerospace Conference**, 17-19 August 2009, METU, Ankara, Turkey.
- 7 A. Heidary, M. P. Fard, M. Malek Jafarian, "Comparing Upwind and Central Schemes in Predicting Stall Characteristics of Naca0012 Using Vorticity Confinement," **Proceeding of the Ankara International Aerospace Conference**, 14-16 September 2011, METU, Ankara, Turkey
- 8 M. Mohaghegh, M. Malek Jafarian and M.H. Javareshkian, "Efficient Time Spectral Algorithm for Time-Periodic Unsteady Problems," **19th Annual Conference on Mechanical Engineering (ISME2011)**, May 2011, Faculty of Engineering, Birjand University.
- 9 Hamed Bagheri-Esfah and M. Malek Jafarian, "Development of Artificial Dissipation Schemes," **19th Annual Conference on Mechanical Engineering (ISME2011)**, May 2011, Faculty of Engineering, Birjand University.

Conference Papers(In Farsi):

- 1- M. M. Jafarian and M. P. Fard, "*Using Matrix Dissipation Scheme to Solve Navier-Stokes and Euler Equations*", Proceedings of **4th International and 8th Annual Conference of Iranian Society of Mechanical Engineers**, May 16-19, 2000, Sharif University of Technology, Tehran, Iran.
- 2- M. M. Jafarian and M. P. Fard, "*Numerical Analysis of Viscous and Inviscid Flows Using Adaptive Grid Scheme*", Proceedings of **6th Conference of Fluid Dynamics**, Feb., 22-24, 2000, Tehran, Iran.
- 3- M. M. Jafarian and M. P. Fard, "*Investigation of Vorticity Confinement for Supersonic and Transonic Compressible Vortex-Dominant Flows*", Proceeding of **8th Iranian Congress of Fluid Mechanics**, September, 2003, Tabriz University, Iran.
- 4- M. M. Jafarian and M. P. Fard, "*Development and Application of Compressible Vorticity Confinement for 2-D Vortex-Dominant Flows*", Proceeding of **10th Iranian Congress of Fluid Mechanics**, Aban 1385, Yazd University.
- 5- M. M. Jafarian and M. P. Fard, "*Development and Application of Compressible Vorticity Confinement for Flows with High Angles of attack*", accepted in **10th Iranian Congress of Fluid Mechanics** but not published, Aban 1385, Yazd University.

- 6- M. P. Fard, Afshar J. and M. Malek Jafarian, “*Using CUSP Scheme for Solving of Euler and Navier-Stokes Equations at Supersonic Speeds,*” Proceeding of **9th Iranian Congress of Fluid Mechanics**, Esfand 1383, Shiraz University.