



VSim7 is Released

The Latest Major Release of VSim Launched July 7, 2014

VSim for Electromagnetics now does GUI-driven problem setup, including importation of STEP, VTK, STL, and PLY CAD formats. New features in this release are available in cylindrical and non-uniform grids, including histories, matrix solvers, and particle emitters. VSim 7 also has improved external circuit modeling capabilities.

[Download VSim 7 Trial for Free.](#)

Improved VSim Meshing

New in VSim 7: VMesh

VMesh™ meshing greatly increases speed of meshing at runtime and is increasingly efficient at higher resolutions.

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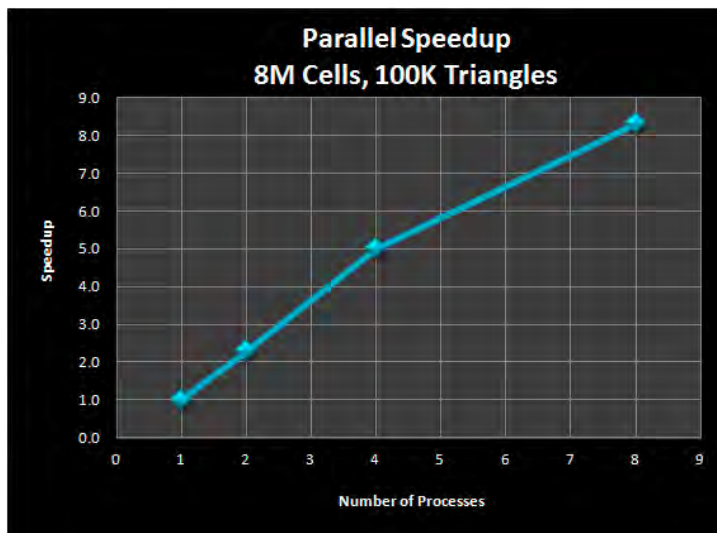
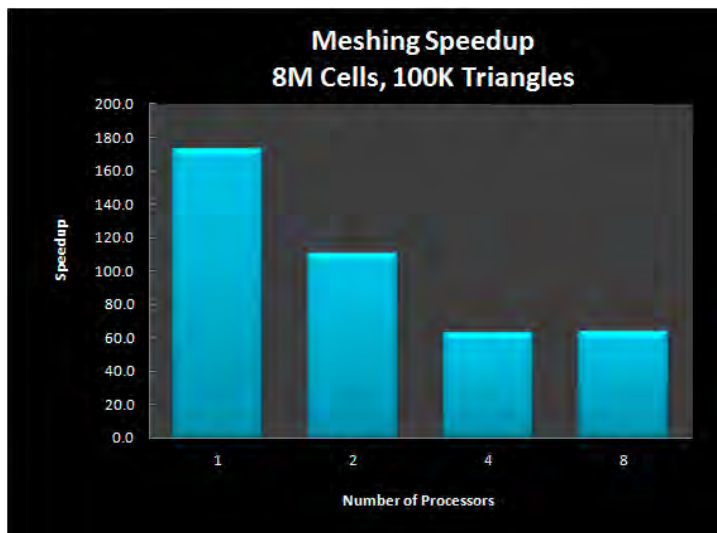
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Plasma Physics Colloquium Seminar at Columbia University



Contact [David Smithe](#) for more information about VSim.

Tech-X Publishes the Most Advanced Dielectric Modeling Algorithm for Finite-difference, Time-domain Electromagnetics

December 15, 2013: CEO John R. Cary, together with University of Colorado employees, Greg Werner and Carl Bauer, publish "A more accurate, stable, FDTD algorithm for electromagnetics in anisotropic dielectrics" in the Journal of Computational Physics. This paper outlines the most accurate and stable time domain algorithm for finite-difference electromagnetics. This paper is in the Journal of Computational Physics, Volume 255, 15 December 2013, Pages 436–455.

September 5, 2014

David Smithe, Tech-X Corporation, presents: "Plasma in Contact with Metal: RF Antenna Near Field Behaviors in Tokamaks"

ANNOUNCEMENTS

Tech-X Presents at APS-URSI

July 7, 2014: Tech-X debuted VSim 7 in Memphis, Tennessee, the birthplace of the Blues and Rock 'n' Roll, at the APS-URSI meeting. VSim 7 is a major advance, with its visual setup, superfast VMesh™ technology, scalability, advanced algorithms, and TruCouple® multiphysics.

Tech-X Presents at the Advanced Accelerator Conference

July 14, 2014: Tech-X presented at the *Advanced Accelerator Conference* in San Jose, California, where its VSim computational application for laser-plasma acceleration and dielectric laser acceleration has been instrumental in scientific discovery. VSim is capable of scaling to over 100,000 cores to solve the largest problems.

PUBLICATIONS

Browning, J., Fernandez-Gutierrez, S., Lin, M. C., Smithe, D. N., & Watrous, J. (2014). Phase control and fast start-up of a magnetron using modulation of an addressable faceted cathode. *Applied Physics Letters*, 104(23), 233507
<http://dx.doi.org/10.1063/1.4883395>.

Lin, M. C., Zhou, C., & Smithe, D. N. An External Circuit Model for 3-D Electromagnetic Particle-In-Cell Simulations, *IEEE Transactions on Electron Devices*, Vol. 61, No. 6, June 2014. 0.1109/TED.2014.2304715

Werner, G. R., Bauer, C. A., & Cary, J. R. (2013). A more accurate, stable, FDTD algorithm for electromagnetics in anisotropic dielectrics. *Journal of Computational Physics*, 255, 436–455.

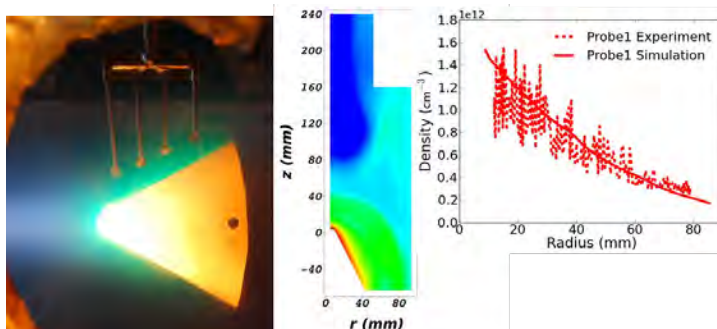
USim Validated Against Hypersonic Flow Experiment

Prof. Michael Keidar of The George Washington University Publishes Results

Prof. Michael Keidar of the Department of Mechanical and Aerospace Engineering at The George Washington University designed an experiment that produces plasma densities similar to that observed for in-flight hypersonic vehicles. Results from this experiment were compared to numerical predictions made by the Tech-X fluid-plasma simulation tool, USim to validate USim flow and ionization capabilities.

Results of The George Washington University experiment are reported in [Laboratory Modeling of the Plasma Layer at Hypersonic Flight](#), Journal of Spacecraft and Rockets.

The results presented in this paper demonstrate USim capability to simulate magnetically confined high speed plasma colliding with a neutral vapor. Plasma discharge from the arc was magnetically confined to generate a high speed flow over a blunt body to mimic hypersonic re-entry flows. The plasma attaches to the cone, re-evaporates into the domain as a neutral fluid and collides with the oncoming plasma jet. The simulation couples MHD equation system for the plasma transport and Euler equation system for the neutral vapor using collision terms. USim results were validated against experimental data collected by Prof. Michael Keidar's group at the Department of Mechanical and Aerospace Engineering, The George Washington University.



Multi-fluid Solver for the Plasma Layer of Hypersonic Vehicles

Contact [Kris Beckwith](#) for more information about USim.

New: [USim Video Tutorials](#)

J. R. (2013). A more accurate, stable, FDTD algorithm for electromagnetics in anisotropic dielectrics. *Journal of Computational Physics*, 255, 436-455.

CONNECT WITH US



Learn USim with Free Online Videos

Beginner, intermediate, and advanced USim video tutorials are available. First, familiarize yourself with the USim interface by learning to run the example *Diffusion from a Cylindrical Wall* simulation. In the two-part intermediate tutorial, learn to run a USim simulation in parallel then learn how to restart a simulation using different input file values and runtime parameters. In the advanced tutorial, see how to modify the *USim Flow Over a Cylindrical Rod* simulation example to change the altitude value and change the equation system from Navier-Stokes to Euler.

GPULib 1.6 MAGMA Library Interface Offers GPU-accelerated Implementation of LAPACK

GPULib GPU-accelerated Library for IDL Includes Suite of Routines for Handling Linear Algebra Problems

The MAGMA library offers a GPU accelerated implementation of LAPACK (Linear Algebra PACKage). The GPULib MAGMA interface provides access to 111 LAPACK routines to solve linear systems and least squares problems, as well as perform singular value, QR, and LU decompositions. Simpler BLAS (Basic Linear Algebra Subprograms) routines are also included with GPULib, provided by NVIDIA's cuBLAS library.

Contact [Michael Galloy](#) for more information about GPULib.

Tech-X UK Supports Ogden Trust Internship Program

The Ogden Trust is a charitable organization, focused on promoting the teaching and learning of physics.

Tech-X UK LTD has been hosting a summer placement student, Matthew Dover, working with us through the Ogden Trust Internship Program. Ogden Trust internships

are available to scholarship alumni. The program is designed to help students understand what a career in science might be like.

Matthew is doing a six week project, starting with benchmarking of USim against some published shock results. We expect this work will particularly enhance the value of USim for those using it as an educational tool, to help train the next generation in fluid dynamics modeling.

Contact [Jonathan Smith](#) at Tech-X UK.