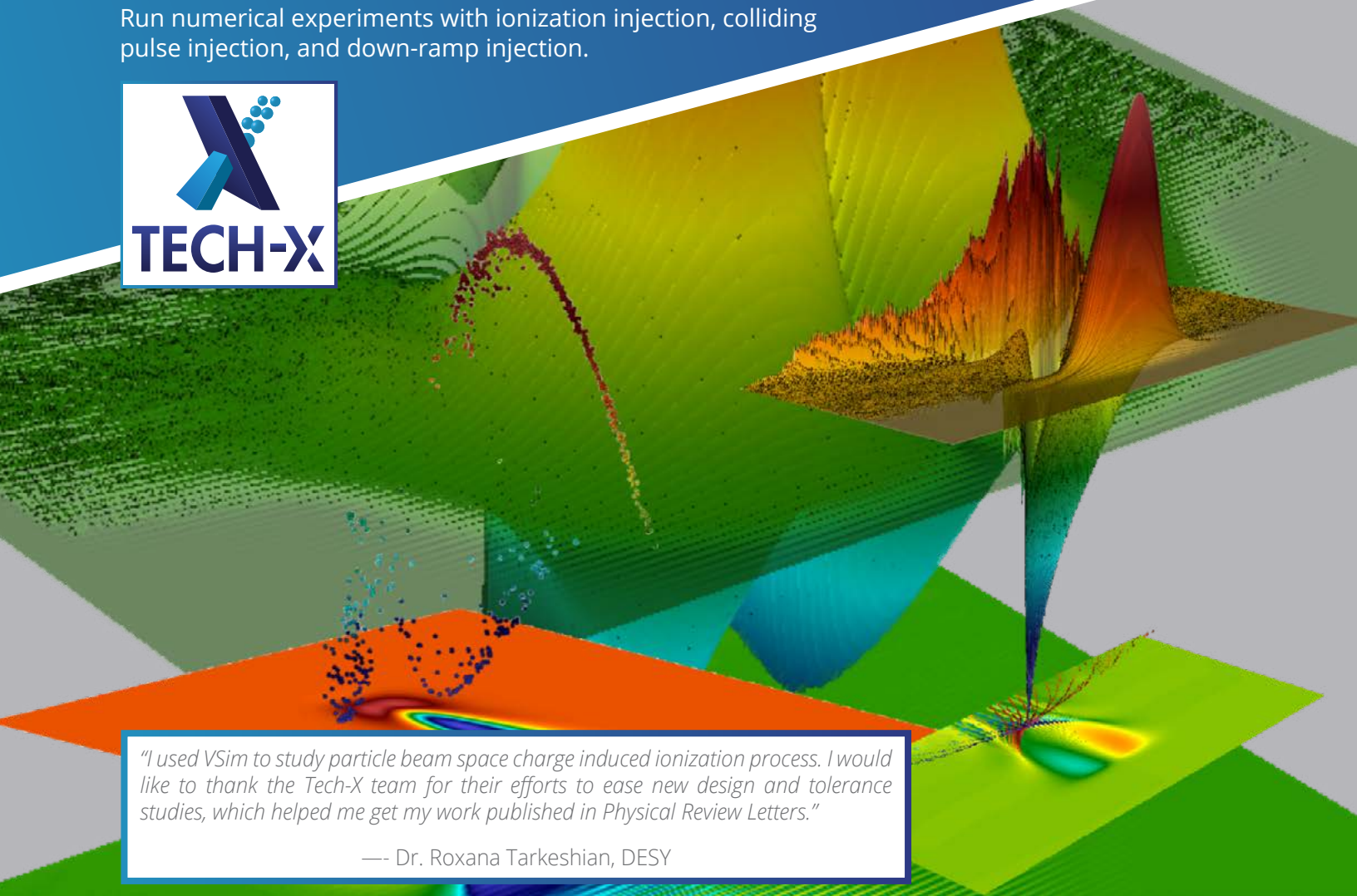


Comprehensive Solution for Novel Acceleration Techniques

Simulate laser-plasma and beam-plasma interactions for advanced acceleration with advanced algorithms.

Run numerical experiments with ionization injection, colliding pulse injection, and down-ramp injection.



"I used VSim to study particle beam space charge induced ionization process. I would like to thank the Tech-X team for their efforts to ease new design and tolerance studies, which helped me get my work published in Physical Review Letters."

— Dr. Roxana Tarkeshian, DESY

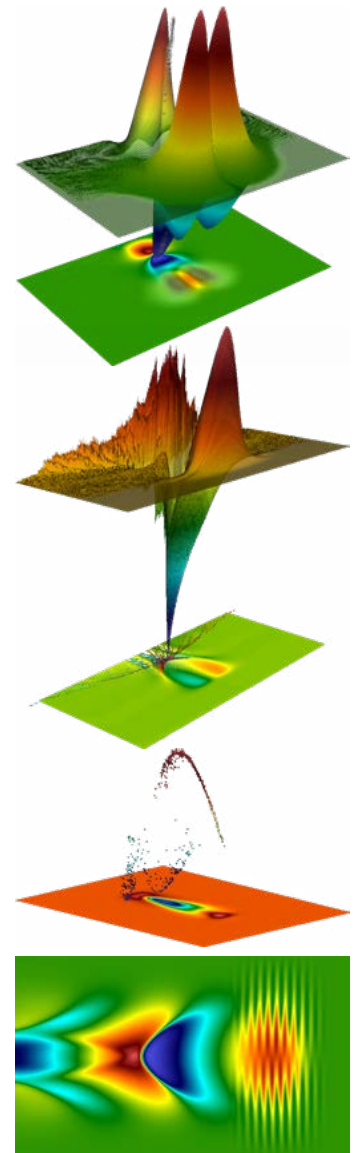
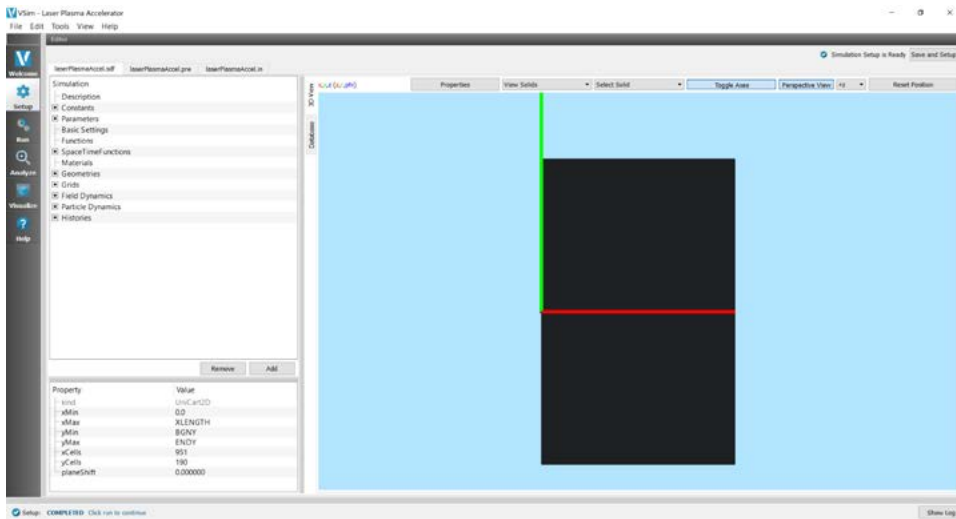
Applications:

- » Beam-driven acceleration
- » Laser-driven acceleration
- » Ionization injection
- » Down-ramp injection
- » Ion channel lasing

VSim for Plasma Acceleration (VSimPA) is a comprehensive software solution for scientists and engineers working on novel acceleration techniques. Using VSimPA's rapid and easy setup, you can run numerical experiments with ionization injection, colliding pulse injection, and down-ramp injection. VSimPA includes reduced methods like the envelope approximation, with or without phase tracking,

to model LWFA into depletion without fully resolving the laser wavelength. Controlled dispersion algorithms limit numerical artifacts.

VSimPA enables you to consider the interaction of laser pulses and relativistic beams with complex plasmas, including interactions such as field ionization. Include all the relevant physical models to get accurate answers.



Right, from top to bottom: Electrons trapped in plasma wakefield due to tunneling ionization, Electrons trapped in plasma wakefield due to two counter-propagating laser pulses, Laser plasma acceleration simulation moving relativistically along laser pulse propagation direction while electron beam is externally injected, Accelerating field in wakefield simulation.

VSImPA Features		
» Laser pulse launching	» Controlled dispersion	» Cold, relativistic fluid
» Beam injection	» Impact ionization	» Euler fluid
» Boosted frame	» Field ionizations	» Absorbing Boundary Conditions
» Advanced beam self-field initialization	» Spatial filtering of fields for noise reduction	» Fast, no-time-counter collisions
» User defined profiles: functional form or text file input		» Envelope model, including with phase tracking

Upgrading Upgrade VSImPA with VSIm for Electromagnetics (VSImEM) to add farfield diagnostics and 2nd order accurate dielectrics. Add VSIm for Plasma Discharges (VSImPD) to gain additional plasma reactions and to include beam-material interactions.

Consulting Services Tech-X offers consulting and training services for all of its simulation software. In addition to the support that comes with every purchase of a VSIm product, we have our experts ready to help you use VSIm to its full extent possible to solve your most challenging problems.

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ABOUT TECH-X

TECH-X is committed to technical excellence and innovation. We combine academic research with a commercial software company sensibility to deliver high quality, cutting-edge software that takes advantage of the latest hardware.

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