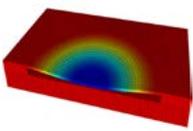


OnScale Solutions for Next-Generation Medical Devices

OnScale brings infinite computational resources to the world of next-generation medical devices, enabling engineers to solve large, real-world problems faster than ever.

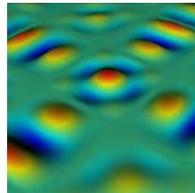
DIAGNOSTICS & IMAGING

OnScale is trusted globally by Fortune 500 companies to help provide clinicians with invaluable knowledge of internal anatomy. The power of OnScale allows engineers to accelerate design cycles via the accuracy and speed of its prediction, while reducing dependency on expensive fabrications of test devices.



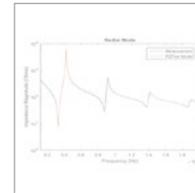
CAPACITIVE MICROMACHINED ULTRASONIC TRANSDUCER

Fully simulate the nonlinear, coupled behavior of CMUTs with electrostatic solver options. Contact and non-contact modes are supported, along with arbitrary drive conditions. Powerful solvers allow analysis of 3D array configurations coupled to electrical components.



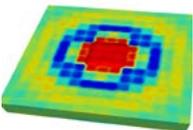
SUB-WAVE-LENGTH STRUCTURES

Include microstructure detail, thin layers such as electrodes, and sub-wavelength targets in the simulation with ease. Mesh refinement allows for features smaller than the required mesh to be placed arbitrarily in the model.



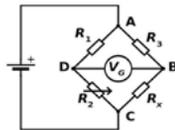
PIEZO MATERIAL CHARACTERIZATION

Simulation results are only as accurate as the material properties used. Through advanced algorithms and ultra-fast numerical simulations, accurate material properties can be backed out from the measured electrical impedance of a sample.



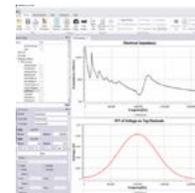
PHASED ARRAYS

Simulate complete linear and 2D matrix probes. Analyze electrical and mechanical crosstalk, directivity, electrical impedance, beamforming and more. Advanced solvers enable large transducer models to be solved in hours rather than days.



ELECTRICAL CIRCUITS

Capture the full system by coupling electrical components into the FEA simulation. Model both transmitted and received electronics in the same simulation. Extract voltage, charge and current at any component in the circuit.



CUSTOM ANALYSIS TOOLS

Extract important metrics quickly and effectively from simulations. Electrical Impedance, Admittance, Conductance, Beam Profiles, Efficiency and other common outputs are available from standard toolsets.

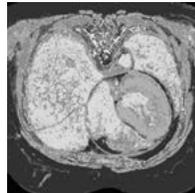
HIGH-INTENSITY FOCUSED ULTRASOUND (HIFU) AND THERAPEUTICS

OnScale has provided tools to simulate HIFU performance in realistic anatomical geometries for over 20+ years. Acoustic and thermal solvers allow designers and clinicians to analyze thermal deposition from acoustic pressure maps, providing better control over focal regions, exact tumor targeting and necessary exposure times to boost patient safety margins.



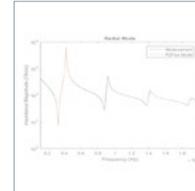
NONLINEAR PROPAGATION

With transient solvers the nonlinear component of wave-propagation falls out naturally. Study the harmonics generated by shock-wave formation, and how this behavior affects the performance of the system, including thermal effects.



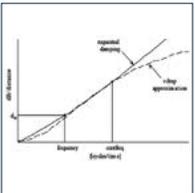
IMPORT TISSUE MAPS

Importation from CT and MRI allows users to simulate their devices under realistic operating conditions. Beam divergence, reflections and pulse width can be quantified quickly. See where acoustic power is being deposited.



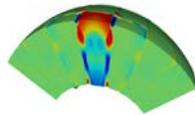
SHEAR WAVE IMAGING

Investigate the performance of Remote Elastography systems in response to arbitrary drives, tissue maps, tissue properties and more. Perform Acoustic Radiation Force simulations to extract accurate stresses and the resultant forces in the elastic tissue.



FREQUENCY DEPENDENT DAMPING

With frequency-dependent damping models for acoustic and elastic materials, including viscoelastic behavior, broadband performance is accurately captured. Capturing the crucial effects of damping ensure that the most accurate thermal model can be achieved.



THERMAL ANALYSIS

Ensure safe treatment planning by accurately simulating the thermal deposition and temperature rise from the ultrasound system. Include the effects of perfusion (blood flow) in the model to evaluate the optimal input configuration.

ABOUT ONSCALE

OnScale, the emerging leader in on-demand scalable engineering simulation software, empowers engineers to accelerate innovation across multiple industries, including next-generation technologies such as MEMS, Semiconductor, 5G, Biomedicine, and Autonomous Vehicles. OnScale combines powerful multiphysics solver technology used and validated by Fortune 50 companies for over 30 years, with the limitless speed and flexibility of cloud High Performance Computing (HPC). By removing the constraints of legacy simulation tools, OnScale allows engineers to dramatically reduce cost, risk and time to market for cutting edge technologies.