

# USim PACKAGES

SIMULATION FEATURES	USim BASIC SIMULATIONS	USim HYPERSONICS	USim HIGH ENERGY DENSITY PLASMAS	USim NEW IN 2.0
<b>GENERAL</b>				
Works in all dimensionalities	●	●	●	
Distributed memory parallelism	●	●	●	
Periodic boundaries	●	●	●	
Open source data format with visualization annotations	●	●	●	
Structured meshes	●	●	●	
Adaptable meshes	●	●	●	
3D unstructured meshes	●	●	●	
Cylindrical coordinates	●	●	●	
Spherical coordinates	●	●	●	
Reads Exodus II mesh format	●	●	●	●
Accelerators for time integration		●	●	●
New examples	●	●	●	●
<b>FLUID FLOW</b>				
Single-temperature compressible flow	●	●	●	
Multi-temperature compressible flow		●		
Navier-Stokes equations		●		
Reaction chemistry		●		
Accelerators for time integration		●		
Multiple species		●		
User defined chemistry tables		●		●
Turbulence model (k-epsilon)		●		●
Ablation		●		●
<b>MAGNETIZED FLOW</b>				
Ideal magnetohydrodynamics	●	●	●	
Gas dynamic magnetohydrodynamics			●	
Separate densities for ions and electrons			●	
Separate velocities for ions and electrons			●	
Separate temperatures for ions and electrons			●	
Anisotropic temperatures for ions and electrons			●	
Full Maxwell's equations			●	
Anisotropic diffusion			●	●
Species collisions			●	●
Improved MHD divergence cleaning algorithms			●	●
Isotropic and anisotropic Poisson solver (linear and non-linear)			●	●
<b>EQUATION OF STATE</b>				
Ideal gas equation of state	●	●	●	
Real gas equation of state		●		
General equation of state		●	●	

## Choose the right package for your needs.

USER INTERFACE FEATURES	USim BASIC SIMULATIONS	USim HYPERSONICS	USim HIGH ENERGY DENSITY PLASMAS	USim NEW IN 2.0
<b>ONLINE HELP</b>				
Full hierarchical documentation access	•		•	
<b>SETUP</b>				
Open existing runs	•	•	•	
Create runs from examples	•	•	•	
Easily adjust key parameters in examples	•	•	•	
Both streamlined and comprehensive input file editor availability	•	•	•	
Input file search capability	•	•	•	
Input file validation	•	•	•	
<b>RUN</b>				
Runtime parameter editing	•	•	•	
Both serial and parallel mode availability	•	•	•	
File browser	•	•	•	
Log views	•	•	•	
Enhanced standard output view	•	•	•	•
<b>VISUALIZATION</b>				
Data type and dimensionality-driven views	•	•	•	
2D slice and 1D lineout field analysis views	•	•	•	
Label, color, and rendering controls	•	•	•	
Time slider	•	•	•	
Image saving	•	•	•	
Visualization capability during runtime	•	•	•	
Vector plots	•	•	•	•