

ANSYS Release 19.2 - Electromagnetics Update

Electronics Desktop

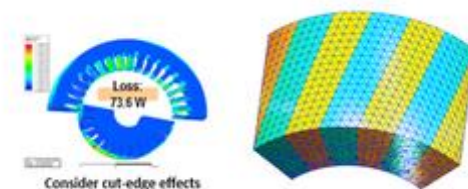
- New product: ANSYS Electronics Desktop 2D Solver (including Simplorer advanced, Maxwell 2D Solver, 2D Extractor Solver, parametric simulations for 2D analysis without Optimetrics licensing) [19.1]
- Integration of Simplorer Advanced in [19.1]
 - ANSYS Maxwell [19.1]
 - ANSYS Maxwell QS [19.1]
 - ANSYS Mechanical CFD Maxwell [19.1]
 - ANSYS Q3D Extractor [19.1]
 - ANSYS SIWAVE [19.1]
 - ANSYS HFSS [19.1]
 - ANSYS Icepak [19.1]
- New Ribbon-based UserInterface
- Improved HPC support
 - ANSYS HPC now universally applicable (no separation between mechanical and electronic products)
 - Four cores with each solver available without further HPC licenses
 - GPU support already from 500,000 unknowns for Eddy Current Solver in Maxwell (at R18.2 only from 2,000,000)
 - Three-level Auto HPC at HFSS (Parametric, Frequency Points, Solver multi-processing)
- Extension of the material database by MEGTRON materials



Easier user guidance thanks to ribbon-based menu bars in the Electronics Desktop

ANSYS Maxwell

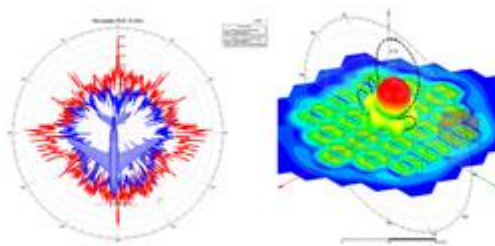
- Consideration of the irreversible influence of a temperature increase on demagnetization
- Non-linear relationship between electric field strength and flux density within electrostatics
- Consideration of non-linearity between electric field strength and current density in DC conduction
- Implementation of an initial electric charge for electrical transient analysis
- Extension of the time domain decomposition for computing time acceleration
 - Non-constant time increment
 - PWM via external circuit
 - translatory movement
- Clone-mesh possibility for bevelled components
- Consideration of machining influences (eg burr) on core losses
- Automated map determination using the Electrical Machine Design Toolkit available for PM-excited and asynchronous machines
- Multi-motion definition for 3D transient analyzes (eg magnetic gears, multi-rotor machines) [19.1]
- Illustration of Magnetization / Demagnetization of Permanent Magnets with the Vector-Hysteresis Model [19.1]
- 3D TDM-TDM linkage for the effective calculation of asynchronous machines [19.2]
- Improved consideration of the skewness [19.2]
- Automatic clone mesh for stationary and moving parts [19.2]



Core losses with consideration of machining influences (burrs) and clone mesh with beveling

ANSYS HFSS

- "3-in-1" solver (FEM frequency domain, method of moments frequency domain, transient)
- Implementation of the SBR + solver in the HFSS GUI
- Add PTD and UTD Physics for "Beam Diffraction" (Physical and Uniform Theory of Diffraction) for the SBR + Solver in the HFSS GUI
- Radar cross sections can be calculated with the SBR + solver
- HFSS 3D Layout: Improved robustness at low frequencies for PI analysis
- Import of Gerber files (RS-274X, eg for Autodesk Eagle & KiCad EDA)
- Parameterized antenna model for SBR + analyzes [19.1]
- New analysis type with focus on SBR + analyzes [19.1]
- HFSS 3D Layout: Intra-plane coupling models for precise power / ground plane analyzes [19.1]
- 3D Components: Possibility of 3rd Party Component Licensing [19.1]
- SBR + Features for Automotive Radar [19.2]
- TDK Chip Antenna Library [19.2]
- Circuit Improvements (User Interface and S-Matrix Coupling) [19.2]
- Evaluation of the far field on spherical surface [19.2]



Diffraction analysis (SBR +) and FaDDM with near-field analysis from HFSS

ANSYS SIwave / Icepak

- Enhanced functionality of the PI Advisor for optimal placement with backup capacitors
- Simplified choices (eg for capacitors between networks)
- Improved push excitations for near and far field analysis

- Implementation of the IronPython IDE command window
- Improved phi mesher for planar structures
- Beta: Coupling with HFSS Regions
- Beta: Integration of Icepak Pre- / Postprocessing into the Electronic Desktop for Thermal Considerations of Electromagnetic Designs (Simple Transfer of Thermal Loads from HFSS, Q3D, Maxwell)
- Automated analysis of 3D submodels (packages, PCB cutouts, ...) using HFSS technology directly from SIwave [19.1]
- Temperature dependence of the capacitors [19.2]
- "Stackup Wizard" [19.2]



Push excitations for near and far field analyzes

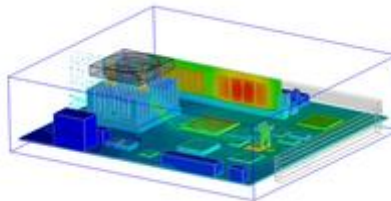


SIwave with HFSS Regions [19.1]

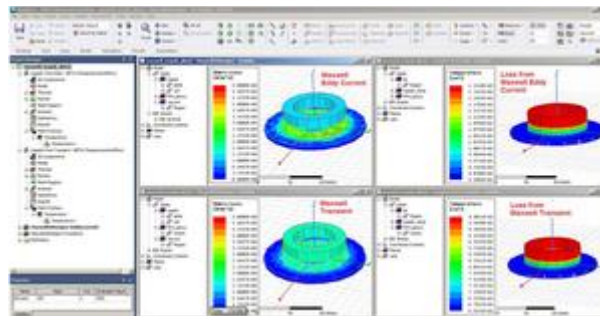
ANSYS Icepak [19.1]

- Integration of Icepak Pre- / Postprocessing into the Electronic Desktop for Thermal Considerations of Electromagnetic Designs [19.1]
- Integrated 3D model simplification [19.1]

- Consideration of PCB layouts [19.1]
- 3D component library [19.1]
- Integrated transfer of thermal loads from HFSS, Q3D, Maxwell [19.1]



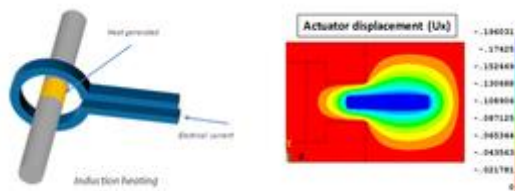
Temperature distribution and speed field of a rack application with included fan [19.1]



Exemplary application for the determination of the thermal effects in combination with a Maxwell analysis [19.1]

ANSYS Mechanical (formerly EMAG)

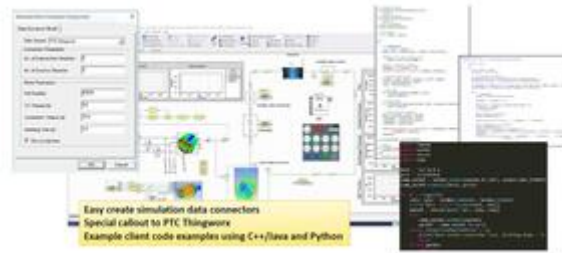
- 22x elements now also with magnetic degrees of freedom. Strong matrix coupling for applications such as
 - Induction heating (electromagnetic-thermal)
 - Actuators (electromagnetic, mechanical)
 - Deformation of current-carrying coils (electromagnetic, mechanical)



Induction heating and electromagnetic actuator

ANSYS Twin Builder (formerly ANSYS Simplorer) [19.1]

- ANSYS Twin Builder becomes ANSYS Twin Builder [19.1]
- Functionalities of the former ANSYS Simplorer Advanced now integrated in electronics products (see above, exceptions: FMI interfaces, Modelica integration) [19.1]
- QuickStart for power electronics implementation (many examples)
- Thyristor models (from ABB and Infineon) and characterizations as well as examples of IGBT and MOSFET characterizations
- Predefined ADC / DAC converter models
- Battery Design Toolkit (available for download from the ANSYS App Store)
- Improved implementation of Modelica in Simplorer
 - "Heating & Cooling" libraries (from the ANSYS App Store)
 - Energy conserving coupling between Modelica and Simplorer
 - Ability to create and (re) use Modelica models in Simplorer
 - Improved graphical view
 - C ++ compiler for Modelica
- Live Data Link for Digital Twins
- 3D Visualization of ROM ("Reduced Order Models")
- Model integration improves:
 - Parameter [19.2]
 - Units [19.2]
 - UI-based text entry [19.2]
 - New tutorials [19.2]
 - Battery cell templates [19.2]
 - Characterization [19.2]
 - AC analysis improvement in feedback loops [19.2]



Live Data Link for Digital Twins

*All information has been prepared to the best of our knowledge.
 Information provided without guarantee.*