

# ANSYS 19.1 Update

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## Electromagnetics

### Electronics Desktop

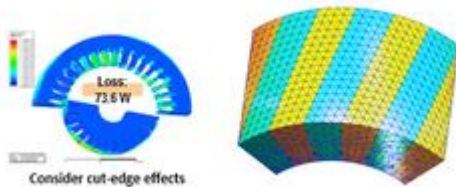
- New product: ANSYS Electronics Desktop 2D Solver (including Simplorer advanced, Maxwell 2D Solver, 2D Extractor Solver, parametric simulations for 2D analysis without Optimetrics licensing) [19.1]
- Integration of Simplorer Advanced in [19.1]
  - ANSYS Maxwell [19.1]
  - ANSYS Maxwell QS [19.1]
  - 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

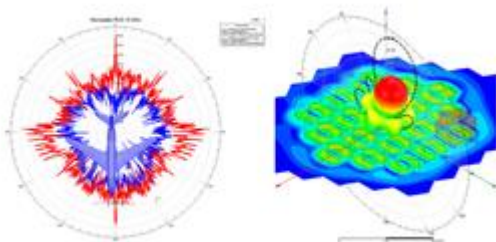
- Consideration of the irreversible influence of a temperature increase on demagnetization
- Non-linear relationship between electric field strength and flux density within electrostatics
- Consideration of non-linearity between electric field strength and current density in DC conduction
- Implementation 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]



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]



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

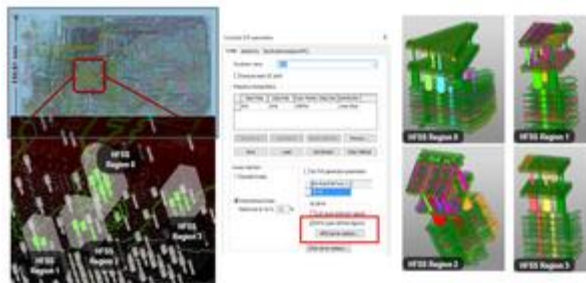
## ANSYS SIwave / Icepak

- 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]



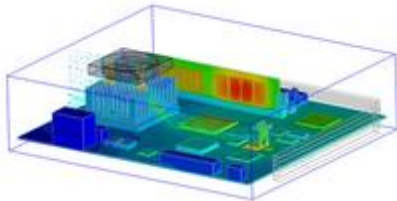
*Push excitations for near and far field analyzes*



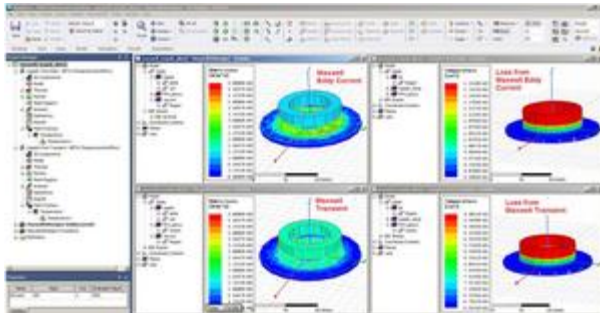
*SIwave with HFSS Regions [19.1]*

## 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]



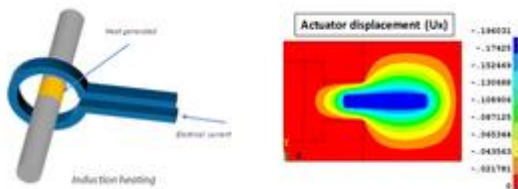
Temperature distribution and speed field of a rack application with included fan [19.1]



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

**ANSYS Mechanical (formerly EMAG)**

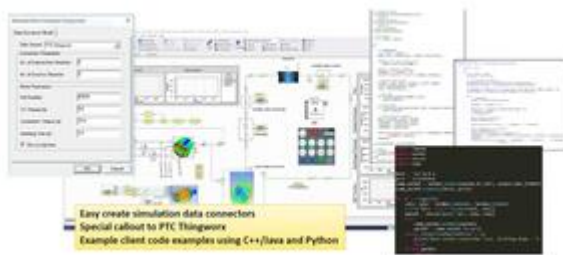
- 22x elements now also with magnetic degrees of freedom. Strong matrix coupling for applications such as
  - Induction heating (electromagnetic-thermal)
  - Actuators (electromagnetic, mechanical)
  - Deformation of current-carrying coils (electromagnetic, mechanical)



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-preserving 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



*Live Data Link for Digital Twins*

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