

## CST MWS 기본 교육 (1월)

# 기본 교육 및 Mobile Antenna & WPT 해석 실습

일시 : 2018년 1월 10일(수) ~ 11일(목)

장소 : 경기도 분당 "CST한국지사"

주최 : CST한국지사

## 교육 프로그램

| 시간   | 교육내용   |
|--|--|
| 제 1 일 (2018 년 1 월 10 일, 수요일) - CST 한국지사 Application Engineer |  |
| 09:30~10:30  | □ Introduction of CST products and Applications  |
| 10:30~12:00  | □ <b>Basic &amp; Advanced Modeling</b><br>Shortcut Icon, View Option, Primitives, Pick Point, Working Coordinate System, Boolean Operations, Basic Modeling, Curve Modeling Tools, Blend and Chamfer Edges, Loft, Shell Solid or Thicken Sheet, Rotate and Extrude Operation, Transform, Operation, Slice by UV Plane, Align Object, Bend Sheet, History   |
| 12:00~13:00  | □ Lunch  |
| 13:00~15:30  | □ <b>Workflow Example 1 : Patch Antenna (Time Domain Solver)</b> <ul style="list-style-type: none"><li>• <b>Patch Antenna Modeling, Simulation Setting</b><br/>Antenna Modeling &amp; 3D CAD Import, Sub-project, Unit, Background Materials, Frequency, Boundary and Symmetry Conditions, Discrete Port, Waveguide Port, Plane Wave, Field Sources, Field Monitor, Global Mesh Properties(hexahedral), Local Mesh Properties, Solver Overview, Time Domain Solver Setting</li><li>• <b>Result Overview</b><br/>S-parameter, Smith Charts, Calculation of Various Electromagnetic Quantities such as Electric Fields, Magnetic Fields, Surface Current, Power Flows, Current Density, Power Loss Densities, Electric Energy Densities, Magnetic Energy Densities, Antenna Farfield (Gain, Beam Direction Side lobe Suppression, Antenna Array, RCS, etc.)</li><li>• <b>Model Parameterization</b><br/>Parameter sweep &amp; Optimization</li></ul> |
| 15:30~17:00  | □ <b>Workflow Example 2 : Phased Array Antenna</b> <ul style="list-style-type: none"><li>• <b>Create Unit Cell Simulation Project (Frequency Domain Solver)</b><br/>Scan angle setting, Unit cell boundary setting, Active elements impedance, Active element pattern</li><li>• <b>Create Full Array Simulation Project(Time Domain Solver)</b><br/>Specify layout, Specify excitation pattern, Farfield results</li></ul>   |

상기 일정은 변경될 수 있습니다.

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## 교육 프로그램

| 시간   | 교육내용   |
|--|--|
| 제 2 일 (2018 년 1 월 11 일, 목요일) - CST 한국지사 Application Engineer |  |
| 09:30~12:00  | <ul style="list-style-type: none"> <li>□ 5G 안테나 해석 사례 소개</li> <li>□ Workflow Example 3-1 : Mobile Antenna (<b>Time Domain Solver</b>)                             <ul style="list-style-type: none"> <li>• PIFA Antenna Design (using <b>Antenna Magus</b>)                                     <ul style="list-style-type: none"> <li>- Antenna design using Antenna Magus</li> <li>- Export an antenna to CST MICROWAVE STUDIO from Antenna Magus</li> </ul> </li> <li>• Unit Antenna Modeling, Simulation Setting                                     <ul style="list-style-type: none"> <li>- Antenna Modeling &amp; 3D CAD Import, Sub-project, Time Domain Solver Setting</li> </ul> </li> <li>• Matching Network(CST DS)                                     <ul style="list-style-type: none"> <li>- Circuits Element, S-Parameter, AC Combine Results</li> <li>- Block Overview, Data Import(Touchstone, Spice, IBIS, etc.), Task Setting (S-Parameter, Transient, AC Combine Results, Operating Point, AC, Combine Results Spectral Line, Mixer, Amplifier)</li> </ul> </li> <li>• Post-Processing                                     <ul style="list-style-type: none"> <li>- MIMO antenna results → MEG, ECC, Diversity Gain, MUX</li> <li>- Advanced mobile phone features =&gt; TRP, TIS, HAC, Bandwidth Potential, Matching Circuit</li> <li>- Calculate body effects → Posable Hands, SAM Phantom, SAR</li> </ul> </li> </ul> </li> </ul> |
| 12:00~13:00  | <ul style="list-style-type: none"> <li>□ Lunch</li> </ul>  |
| 13:00~15:00  | <ul style="list-style-type: none"> <li>□ Workflow Example3-2 : Mobile Antenna (<b>Time Domain Solver</b>)                             <ul style="list-style-type: none"> <li>• Full Phone Modeling, Simulation Setting</li> <li>• Post-Processing                                     <ul style="list-style-type: none"> <li>- Advanced mobile Phone features → TRP, TIS, HAC, Bandwidth Potential, Matching Circuit</li> <li>- Calculate body effects → Posable Hands, SAM Phantom, SAR</li> </ul> </li> </ul> </li> </ul>  |
| 15:00~17:00  | <ul style="list-style-type: none"> <li>□ Workflow Example 4 : Wireless Power Transfer(<b>Frequency Domain Solver</b>)                             <ul style="list-style-type: none"> <li>• Modeling, Simulation Setting                                     <ul style="list-style-type: none"> <li>- Curve, Curve Tools, Cutting Plane, Global Mesh Properties(Tetrahedral), Frequency Domain Solver Setting</li> </ul> </li> <li>• Matching Network (CST DS)                                     <ul style="list-style-type: none"> <li>- S-Parameter, Smith chart, Z-Parameter, Y-Parameter, K-Factor, Energy transfer efficiency, AC, Combine Results, Input and output power</li> </ul> </li> <li>• Matching Network Parameterization (CST DS)                                     <ul style="list-style-type: none"> <li>- Tune, Parameter sweep, Optimizer</li> </ul> </li> <li>• Align the Coil in Mobile Phone Model</li> </ul> </li> <li>□ (Appendix) Workflow Example 5 : Wearable UHF RFID Tag                             <ul style="list-style-type: none"> <li>• Modeling, Simulation Setting(CST DS + CST MWS (Time Domain Solver))                                     <ul style="list-style-type: none"> <li>- Schematic Layout using Block Model(Microstrip Line Block, Stripline, Waveguide, Ideal Microwave RF blocks), System Assembly and Modeling</li> </ul> </li> <li>• Bending Tag on 3D Objects</li> </ul> </li> </ul>           |