

## CMC CoventorMP Training

February, Wednesday 26 and Thursday 27, 2020

### Abstract

This two-day training is to introduce and train participants to Coventor design tools for the MEMS designer. It focused mainly on the platform CoventorMP which contains MEMS+® and CoventorWare®. SEMulator3D® the 3D semiconductor and MEMS process and fabrication modeling platform will also be introduced. It is a mix of presentations and practical tutorials.

### Detailed Agenda

#### Day one – February, Wednesday 26– MEMS+ Training

Time	Topic	Content
09.00 – 09.30	CoventorMP and MEMS+ Overview	<b>CoventorMP+ the MEMS designer platform</b> <ul style="list-style-type: none"> <li>CoventorMP Introduction</li> <li>What is MEMS+ and what does it do</li> <li>Quick introduction to MEMS+ interface</li> </ul>
09.30– 10.30	Model Construction I	<b>Exercise: Assembling the SiGe accelerometer model in MEMS+</b> <ul style="list-style-type: none"> <li>Creating a parametric model using variables</li> <li>Understanding the hierarchical relationship of a MEMS+</li> <li>Constructing structure using MEMS+ components</li> </ul> <b>Technical presentation: Mechanics &amp; Sub-schematic</b>
10.30 – 10.45	Coffee Break	
10.45 – 12.30	Model Construction II	<b>Exercise: Assembling the SiGe accelerometer model in MEMS+</b> <ul style="list-style-type: none"> <li>Connectivity: boundary conditions and using the Wizard</li> <li>Electrostatic elements: adding electrostatics to a design</li> <li>Damping: adding squeeze film damping to the model</li> </ul> <b>Technical presentations: Electrostatics and Damping</b>
12.30 – 13.30	Lunch	
13.30 – 14.30	Built-in Simulator	<b>Exercise: Simulating the model with MEMS+ built-in simulator</b> <ul style="list-style-type: none"> <li>Set up BCs and expose pins in Innovator</li> <li>DC, Modal and Harmonic analyses</li> <li>View 3D &amp; 2D result in Scene3D</li> </ul>
14.30 – 15.30	MathWorks Environment	<b>Exercise: Simulating the model with MATLAB and Simulink</b> <ul style="list-style-type: none"> <li>Set-up Matlab to work in conjunction with MEMS+</li> <li>Scripting and Simulink simulations</li> </ul>
15.30 – 15.45	Coffee Break	
16.00 – 16.45	Cadence Environment	<b>Exercise: Simulating the model within Cadence environment</b> <ul style="list-style-type: none"> <li>Instantiating the MEMS+ model in Cadence library</li> <li>Virtuoso schematic and Spectre simulation</li> </ul>
16.45 – 17.15	Advanced Simulations	<b>Exercise: Advanced Simulations</b> <ul style="list-style-type: none"> <li>Reduced Order Model</li> <li>Export to CoventorWare</li> </ul>

**Day two – February, Thursday 27– CoventorWare Training**

Time	Topic	Content
09.00 – 09.30	CoventorWare Overview	<b>CoventorWare Review</b> <ul style="list-style-type: none"> <li>What is CoventorWare and what does it do.</li> <li>Understanding the interface</li> </ul>
09.30 -10.30	Model Construction I	<b>Exercise: Model creation with Designer</b> <ul style="list-style-type: none"> <li>Layout and process</li> <li>Solid Model Builder</li> </ul>
<i>10.30 – 10.45</i>	<i>Coffee Break</i>	
10.45 -12.30	Model Construction I	<b>Exercise: Preprocessor</b> <ul style="list-style-type: none"> <li>Meshing creation</li> <li>Symmetry and face name for boundary conditions</li> </ul>
<i>12.30 - 13.30</i>	<i>Lunch</i>	
13.30 – 14.30	Simulation I	<b>Exercise: Analyzer – MemMech and MemElectro Analyses</b> <ul style="list-style-type: none"> <li>Configuring and running the solvers</li> <li>MemMech: DC and Modal Analysis</li> <li>MemElectro: Electrostatic charge and force</li> </ul>
14.30 – 15.30	Simulation II	<b>Exercise: Analyzer – Sensitivity Analysis</b> <ul style="list-style-type: none"> <li>MemMech MemElectro sensitivity analysis</li> <li>CoSolve electro-mechanical coupled analysis</li> </ul>
<i>15.30 – 15.45</i>	<i>Coffee Break</i>	
15.45 – 16.45	Semulator3D	<b>Semiconductor and MEMS predictive modeling of complex fabrication process flow</b>
<i>16.45 – 17.00</i>	<i>Wrap Up</i>	

**Coventor, a Lam Research Company**

3 Avenue du Québec - ZI de Courtabœuf  
 91140 Villebon sur Yvette, France

[www.coventor.com](http://www.coventor.com)

Contact: [mems.support@coventor.com](mailto:mems.support@coventor.com) / Tel: +33 (0)4 76 61 49 31

**Arnaud Parent**

[arnaud.parent@wanadoo.fr](mailto:arnaud.parent@wanadoo.fr)

Senior Applications Engineer | MEMS R&D | Coventor SARL

Mobile +33 6 63 08 32 67