

# **Multiphysics Modelling and Simulation of Implantable Wireless MEMS Capacitive Sensor for Cardiovascular Diagnostics**

R.Yogeswari<sup>1</sup>, S.Venkateshwaran<sup>1</sup>, K.Umapathi<sup>1</sup>

<sup>1</sup>United Institute of Technology,Coimbatore,Tamil Nadu, India

## **Abstract**

Monitoring the Central aorta is a more effective way to diagnose cardiovascular diseases than conventional techniques. Approximately, six million people in the world are currently living with aortic aneurysm and every year 750,000 new cases are diagnosed. This paper presents the design and simulation of biocompatible Wireless MEMS sensor for detection of intraoperative leaks of the stent graft during aortic Aneurysm repair and for delivering aortic pressure information. In this work we simulate hermetic and semi-hermetic designs of the flexible resonant sensors and the quality factors thus achieved with different substrates. Using COMSOL Multiphysics®, dynamic pressure waveforms are obtained which exhibit the deformation in the structure of the sensors due to blood flow, and detect the signs of abnormal conditions in the endovascular system.