GRAVIMETRIC AND BIOLOGICAL SENSORS BASED ON SAW AND FBAR TECHNOLOGIES

William Milne, Cambridge University
wim@eng.cam.ac.uk
Girish Rughoobur Cambridge University
Mario de Miguel Ramos Cambridge University
T.Mirea Universidad Politicnica de Madrid
M.Clement Universidad Politicnica de Madrid
J.Olivares Universidad Politicnica de Madrid
B. Diaz-Duran Universidad Politicnica de Madrid
J.Sangrador Universidad Politicnica de Madrid
I.Miele Cambridge University
E.Iborra Universidad Politicnica de Madrid
A.J.Flewitt Cambridge University

Key Words: sensors, FBARS, gravimetric, biological.

This presentation will describe the development of Gravimetric and Biological Sensors based on SAW and FBAR Technologies. The SAW devices were fabricated on polycrystalline ZnO thin films deposited using both standard R.F. sputtering techniques and a novel High Target Utilisation Sputtering System (HiTUS). This system ensures that we can produce the low stress films at the high deposition rates necessary for such structures to operate efficiently. However in order to further improve the sensitivity of our sensors we have also investigated the use of Thin Film Bulk Acoustic Resonators (FBARs) . We will describe standard gravimetric sensors based on such material and also gravimetric sensors for use in liquid environments through the use of inclined c-axis ZnO material. The talk will conclude with a discussion of dual mode thin film FBARs for parallel sensing of both mass loading and temperature.