



IDCOM Lunchtime Seminar

Tuesday 28 April 2015, 1.00pm

AGB Seminar Room

AGB Building, King's Buildings, EH9 3JL

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Graphene Reconfigurable Antennas for Microwave Applications

Abstract: Wireless devices are becoming packed with more applications that require an increasing number of communication systems. However, the space available for antennas is conversely being reduced more and more. A potential solution to save space in wireless devices is to use reconfigurable antennas where multiple antennas can be integrated into one. A reconfigurable antenna is able to change actively any of its radiation properties such as resonant frequency, bandwidth, radiation pattern, or polarization. This is commonly achieved by using mechanical or electrical switches, varactors or tunable materials via applying a mechanical, electrical, magnetic, light or thermal bias. This talk presents a study of using graphene in reconfigurable antennas for wireless communication applications in the microwave regime. A variety of designs made fully or partially of graphene are analysed for potential applications in Wireless Fidelity (WIFI), Long Term Evolution (LTE), Digital Audio Broadcast (DAB), Global Navigation Satellite Systems (GNSS), and others. Results show that graphene can be used as an alternative method to divert currents propagating in antennas and therefore to actively reconfigure antenna properties such as frequency and polarization. However, integrating graphene in antennas causes the antenna efficiencies to strongly vary depending on the end application. New designs could be implemented where the graphene's impact will be reduced.

Info: Christian Nunez is a PhD candidate at the Institute for Digital Communications (IDCOM). His research is focused on creating novel compact antennas for future wireless systems using materials such as graphene, carbon nanotubes (CNTs) and metamaterials (MTM).

Pizza from 12.30pm – 2nd floor foyer