3G Phones, Bluethooth Devices: Are They Safe?

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Ground breaking research in understanding the characteristics of human skin at millimetric waveband (MMW) frequencies is being conducted at Cranfield University – academic partner to the Royal Military College of Science at Shrivenham, Oxfordshire.
Leading the research study, Dr Clive Alabaster of the Radar Systems Group at Cranfield University, says:
“This research study is important because MMW frequencies are increasingly being used in a large number of applications in radar as well as defence and civilian communications, such as guided missiles, 3G mobile phones, radio antennas, car cruise control and collision avoidance radar systems, and even airport security check-points.

“To date, only predictive studies have attempted to describe human skin at these very high frequencies. This research study is for the first time collecting hard data in order to assess the potential risks associated with this technology.

“The simple fact is that skin exposed to these very high frequencies bears the brunt of radiation exposure. As a result, the skin absorbs MMW frequencies and is heated on the surface with very little power penetrating to other tissue types which are deeper in the body,” explains Dr Alabaster.

The research programme, sponsored by Japanese measurement equipment manufacturer Anritsu, has arrived at some preliminary results.

Using the safety benchmark set by the National Radiological Protection Board (NRPB) of 10 milliWatts per square centimetre, Dr Alabaster calculated the temperature rise of skin exposed to this level of MMW radiation over a 30 second period.

“The initial results on a single skin sample showed that this exposure would cause the surface of the skin to heat by only 0.2°C. The body will hardly notice this increase in temperature and so we can conclude that current legislation will avoid any burning hazard. Our future work in this area will reaffirm these results and seek to extend the study to a much wider variety of skin samples,” adds Dr Alabaster.

“Sponsorship of the Vector Network Analyser (VNA) equipment used by Dr Alabaster is a key part of our own research and development programme and provides us with valuable access to an important customer base which includes the Ministry of Defence, DSTL and QinetiQ,” says Gerald Ostheimer, European General Manager, Anritsu.

The same techniques that Dr Alabaster has applied to the measurement of skin are now being employed in the investigation of damage sustained by composite materials and structures. “These range from novel bridge materials through to helicopter rotor blades and even the materials of today’s modern sports cars,” concludes Dr Alabaster.

Source: Cranfield University