

# Molecular RFID System Design Using a Micro-ring Transceiver

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## Editorial

Micro and Nano communications have involved in current modern communication technology [1-3], where the user demands and security requirements have been the challenge, therefore, the searching of new technologies with the secure extremely is dynamically continued, in which the quantum technique is only the one recommended today that can give user demands and requirements. Till date, such technology for the security requirement is now seen, where recently the evident device that uses the material known as a graphene material has shown the interesting aspects. In which the dual properties are mobility and polarizability can be obtained simultaneously when light is propagated into the graphene with the selected wavelengths, which is the very interesting aspect for electronic and optoelectronic applications. Moreover, such a material can be made to be the micro/nano scale device, which is the required device scale today. Yupapin and his researchers have also suggested the very interesting device known as a Panda ring resonator has shown the interesting results and aspects [4-7], which can serve the two property requirements, mobility and polarizability, which allow the use for a short range transmission device. By using such a device, the WGM can also be generated that can be used for various applications, especially, the free space(wireless) links, which are (1) molecular/atom trapping tool, short range electronic/molecular communications, (2) atom/molecule transceiver, (3) atom/molecule sensors, (4) communication security and wavelength division multiplexing/dense wavelength division multiplexing (WDM/DWDM) system etc.

In Figures 1 and 2, atom/molecule can be trapped by the whispering gallery mode (WGM) probe and transmitted/received via the transceiver, where the optical/electrical trapping media can be used to form the free space communication link. The short range radio frequency identification and detection (RFID) using the micro-ring antenna can also be performed, in which the input radio frequency (RF) signal can be added into the Add port via the external input laser source, where the modulation signal and the input data can be added and propagated via the micro-ring antenna(transceiver), from which the graphene material can introduce both mobility and polarizability,

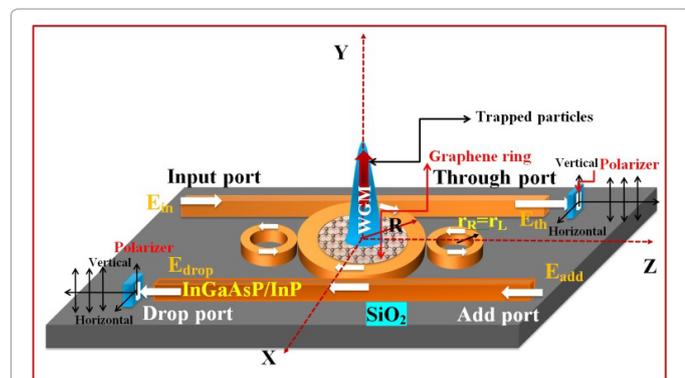


Figure 1: A micro-ring transceiver using a graphene Panda ring resonator.

where the two way communications in both aspects by electromagnetic wave and polarized light via the transceiver is realized. In application, the demodulation of the output signal allows that the required signal and codes can be retrieved via the end user (receiver). In analogy, the origin signal is sent by Alice and securely retrieved by Bob, which is useful for mobile telephone security, where the up-and down link to the base station can be supported (Figures 1 and 2).

Moreover, the short range communication network known as ad hoc network can also securely implemented by using the micro-ring

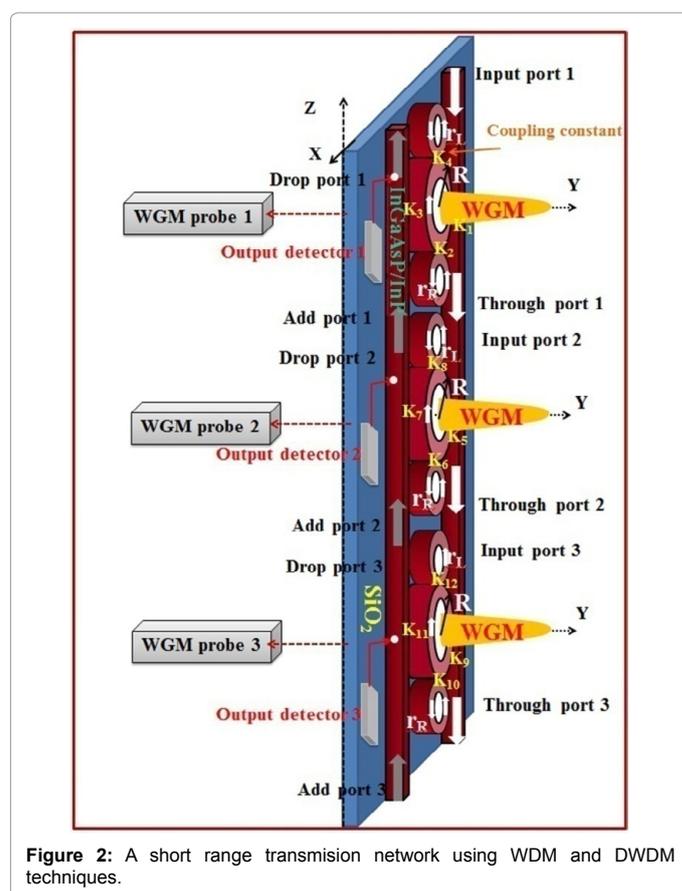


Figure 2: A short range transmission network using WDM and DWDM techniques.

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transceiver including within the system for a short range network. The output is connected to the communication media that can be electron/molecule/light, where the security is covered by the quantum method. The security is controlled by polarization states, from which the reference and signal qbits are added and checked before the required data being securely retrieved, where finally, the required data is linked safely between Alice and Bob.

In conclusion, a micro ring resonator made by the grapheme material has shown the very promising challenge for modern mobile communication, where the 4G and 5G links are widely used, where the security is extremely required. The grapheme material has shown the excellent two properties in both electrical and optical properties, which are very useful in various applications. In terms of light probe, the use of a trapping tool known as tweezers can be incorporated the use for other forms of communications, where the trapping atom/molecule can be used to form the short range communication link, in which the communication technology will be completely changed and challenged. In application, the use of ad hoc network with the personal telephone (mobile telephone) is very interesting, where in this case the link among the concern clients can be link by their own server, which is not required the base station at all, while the other forms of communication can also be applied, which will be the challenge research in the near future.

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