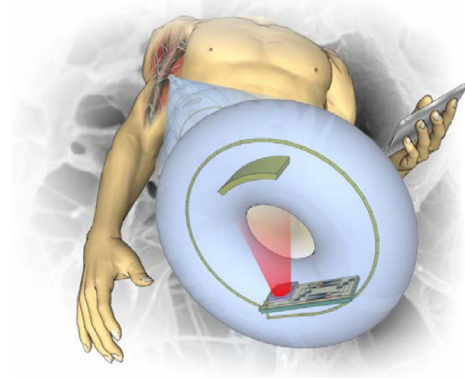
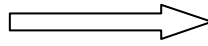


Can we measure gases from our mobile phone? Or knowing our glucose level in our body real time?



Typical spectroscopic system

Toward
miniaturized
spectroscopic
system



Continuous glucose monitoring system

Knowing concentration of carbon dioxide in your house during winter? Or monitoring glucose level in body real time? The system performing this function typically consists of a source which transmits light through dispersive component to separate light into different colors. Depending on gases, it absorbs light at different color differently. Detector is used to detect the light after it passes through the system. Therefore, gases concentration is determined. Currently, the available systems to perform such functionalities are rather large and consist of several expensive components. The operation of the machine is also very complicated. Therefore, it is impossible for ordinary people to afford such a system for home used basis. The group of scientists at UGent is currently working toward miniaturized version of such system. The research consists of spectroscopic system design, Integration technology of active components such as laser and detector and electronic IC. The spectroscopic system is designed on Silicon-on-Insulator platform which is a well-known technology for electronic chip fabrication. For integration technology, we develop adhesive bonding technique with the use of polymer-Benzocyclobutene. We now demonstrate the first prototype of integrated spectroscopic system in the size of one euro coin. Spectroscopic functionality is being carried out. These results have great impact on future sensing device design

We have demonstrated the first prototype spectroscopic system in shortwave infrared for glucose sensing application. This device operates at room temperature with high sensitivity.