Researchers at the University of South Florida have developed a continuous glucose monitoring system based on measurement of the return loss of an antenna patch without implanting into the skin.

Diabetes mellitus is a metabolic disease in which the body is unable to produce or properly use insulin, leading to elevated glucose levels in the blood. All currently approved US Food and Drug Administration (FDA) continuous glucose monitoring (CGM) require a disposable needle-like insertion into the body, which lasts only up to a week. CGM also requires calibration four times a day with the finger sticking blood sample technique, since the measurement is not done directly on the blood glucose, but rather measures the glucose of the interstitial fluid. The patient would prefer a less invasive method to monitor the glucose levels, and many have been tried, but have experienced gradual loss of sensor functionality and stability.

Our researchers have invented a novel glucose monitoring system with the antenna on the external surface of the body. The glucose concentration in the blood is determined by the sensor on the blood vessel with shift in the resonant frequency. These variations of resonant frequency are displayed in glucose levels. With the implementation of this system architecture, an accurate, real time assessment of glucose levels in the blood can be made using a single antenna patch.

**ADVANTAGES:**
- Non-invasive system
- Accurate measurements
- Continuous monitoring of glucose level
- Easy replacement

**Continuous Glucose Monitoring System Without Any Implant**

Arm Physiology Sectional Cut Showing the Antenna is Placed Over the Skin

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