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Transmission Systems

Electronic Technician Association International (ETA international) NYCCT-Club

THz generation and detection

On October 17th, 2013, I attended to an ETA student club meeting on City Tech. For this meeting they had a guest speaker, Dr. Ummy, giving a talk on his Tera-hertz generation and detection. This was a very interesting meeting because I had the opportunity to become familiar the technology involve in the Tera-hertz. As Dr. Ummy explained Terahertz (THz) generation and detection has been a very challenging task for engineers. THz radiation is located in a position in the electromagnetic spectrum that makes it difficult to generate and detect. Its frequency is too high to be efficiently manipulated with semiconductor devices and the energy of THz photons is too weak to be detected by conventional photonic devices. Presently, there are THz detectors that due to the low sensitivity could not be used for application such as imaging of inorganic material and biological specimens. In that presentation Dr. Ummy described the methodology and the development of a THz detector using Sagnac interferometer coupled with variable stress depending polarizing material. This THz detection technology consist on exposing a segment of optical fiber forming the Sagnac interferometer to THz radiation. The exposed fiber is doped with THz sensitive materials which will change the interference

pattern there by changing the output intensity. Then, by measuring the intensity the detection of THz radiation is possible.