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NYCCT & ETA International Chapter Meeting

Optimization of Coupling Efficiency Plasmonic Devices - Professor Mynbaev

Generation of THz - Professor Ummy

A NYCCT & ETA International Chapter Meeting at City Tech I attended on October 17th, 2013 had two guest speakers Professor Mynbaev and Professor Ummy. Professor Ummy spoke first on his work with the Terahertz generation and detection that has been seeing many advancements and research as of late. The high frequency characteristic of the terahertz waves doesn’t allow it to be generated, measured and detected by traditional methods. His presentation described work on a terahertz detector using a sagnoc interferometer coupled with variable stress depending polarizing material. The process is done by exposing a segment of optical fiber forming the sagnac interferometer for terahertz radiation. The exposed fiber is doped with terahertz sensitive materials which will change the interference pattern there by changing the output intensity. By measuring this intensity the detection of terahertz radiation is possible. Professor Ummy hoped that the applications of this process could be those similar to x-ray technologies.

Professor Mynbaev presentation on plasmonics explained that it is the coupling of photons to free electron oscillations between the thin film of a conductor and a dielectric creating two dimensional electromagnetic waves. His experiment determined that the natural metals widely used in plasmonics have fundamental limitations in their application in optical communications. They have also been able to determine the optimal material for optimal coupling efficiency and its characteristics such as electric permittivity, reflection coefficient, and the strength of a resonance field. This material could achieve and increase of the strength of its field by an order of magnitude at 1550nm.