Time & Location: March 30, 2015 at 1:00 PM in HEC 356
Title: AN OPTIMIZATION OF THERMODYNAMIC EFFICIENCY VS. CAPACITY FOR COMMUNICATIONS SYSTEMS

The proliferation of Mobile Communications platforms is challenging capacity of networks largely because of the data rate at each node. This places significant demands on the performance specifications of personal computing devices as well as cellular and WLAN terminals competing for network access, particularly power consumption. Greater information throughputs are required per node while maintaining a quality of service. This translates to shorter meantime between battery charging cycles and increased thermal footprint. Solutions are required to counter this trend.

This work provides a fundamental view of the mechanisms which affect the thermodynamic efficiency of communications processes along with a method for efficiency enhancement. It is shown that the efficiency of all communications process is related to the dynamic range of momentum exchanges between particles and fields. Several standards based signals are examined to illustrate the potential benefit of the disclosed efficiency enhancement methods.

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Approved for distribution by Pawel Wocjan, Committee Chair, on March 30, 2015.

The public is welcome to attend.