ASTRONOMY & ASTROPHYSICS DIVISION SEMINAR

Title : The Paradox of Power Loss in a Lossless Infinite Transmission Line

Speaker : Dr. Ashok K. Singal, PRL

Date : 03. 10 . 2013 (Thursday)

Time : 16:00 Hrs

Venue : Room # 114 (Thaltej Campus)

ABSTRACT :

A famous long-standing paradox in Electrical Engineering is of a continuous power drain from the generator at the input of an otherwise lossless infinite transmission line. We show that the resolution of the paradox lies in the realization that in an open-circuit finite line, while the source does keep on supplying power as an incident wave, the reflected wave brings an equal amount back to the source, with no net power loss. The oscillations in even a simple, driven LC circuit are the superposition of incident and reflected waves.

But there is no reflected wave in the infinite line, since the incident wave never reaches the termination at infinity to start a reflection. The power lost by the generator in the infinite line ultimately appears as the stored electromagnetic energy in the capacitances and inductances further down the line as the incident wave advances forward. It is also shown that contrary to some earlier suggestions in the literature, radiation plays absolutely no role in resolving this paradox.

All are welcome.....
Bus will be available from PRL main campus at 15:30 Hrs