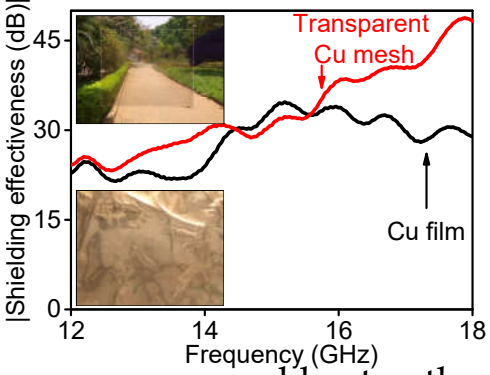
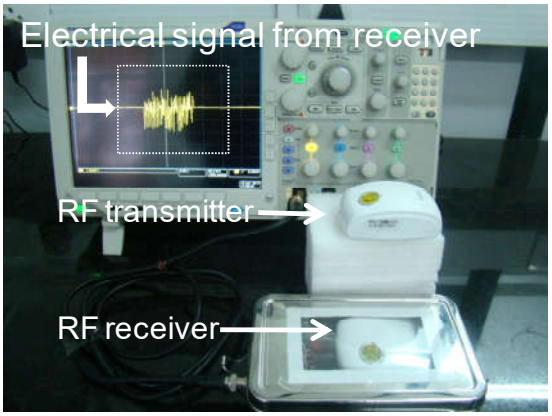
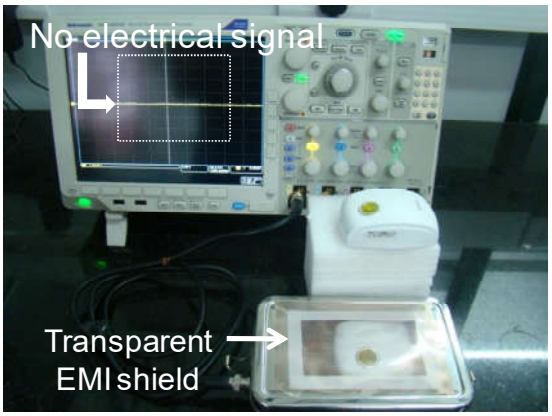
Invisible EMI shield

Faraday cages, which shield the electromagnetic radiation have been around since the dawn of radio communication. They are usually made of thick metal structures and hence are opaque. Making Faraday cages transparent provides many distinct advantages besides enhancing visual space.

The present display is based on invisible metal mesh (i2M) embedded between PET sheets. Although the wires are very fine (a few micrometer wide and sub-micrometer thick), the EMI shielding is as effective as from an opaque metal sheet due to radiation trapping amidst percolative wire structures with intervening spaces comparable to the wavelength range of interest (12– 18 GHz). This is well done while maintaining a visible transparency of ~ 75 -80%.







In the example shown, a metal box whose top is cut open, hosts the receiver, covered with i2M embedded PET or with plain PET, the later serving as a control. When the box is kept open or while covered with PET, the radiation signal from the transmitter is able to reach the receiver. When i2M embedded PET sheet covers the box, the signal is obstructed and thus, the receiver is shielded from the radiation.

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