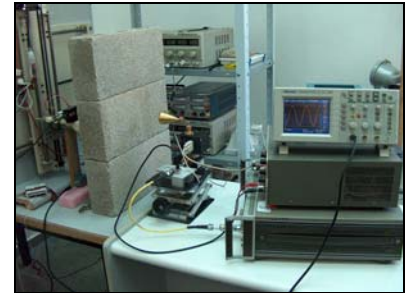
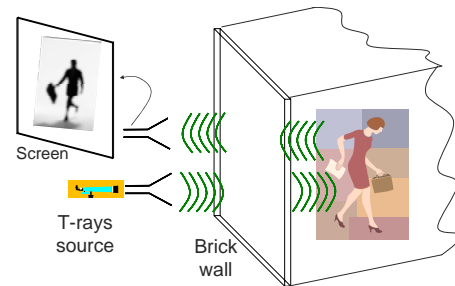
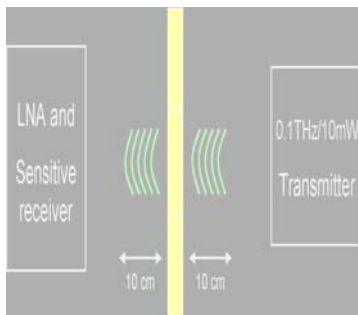


Through-the-Wall Imaging with MM Wave Radiation

- ❖ A through-the-wall imaging device is designed.
- ❖ It is based on a millimeter wave high power source.
- ❖ The source is designed to be a portable low cost electron tube.
- ❖ The device operates at ~100 GHz and delivers ~1kW.
- ❖ An image of targets beyond walls is constructed within ~1minute.



Results

- ❖ Measurement of 0.1THz through a brick wall is demonstrated.
- ❖ 10mW transmitting power and sensitive applicable detector are used.
- ❖ 60~70 dB attenuation of the concrete bricks wall is measured.

Power estimation

- ❖ $60\text{dBm (1kW)} - 70\text{dB (wall 1)} - 70\text{dB (wall 2)} - 20\text{dB (RCS)} - 20\text{dB (others)} = -120\text{dBm}$
- ❖ -120dB is the applicable sensitivity!

Detection capabilities

- ❖ High power mm wave will enable the penetration of 2 walls (forward and backward scattering) and support target identification as well as higher resolution imaging.
- ❖ A through-the- wall imaging device is designed, based on a high power radiation source and imaging techniques.