Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Channel model for human body communication]
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Re: [ ]

Abstract: [Introduction of the channel model for the human body communication]

Purpose: [To introduce the channel model for the human body communication]

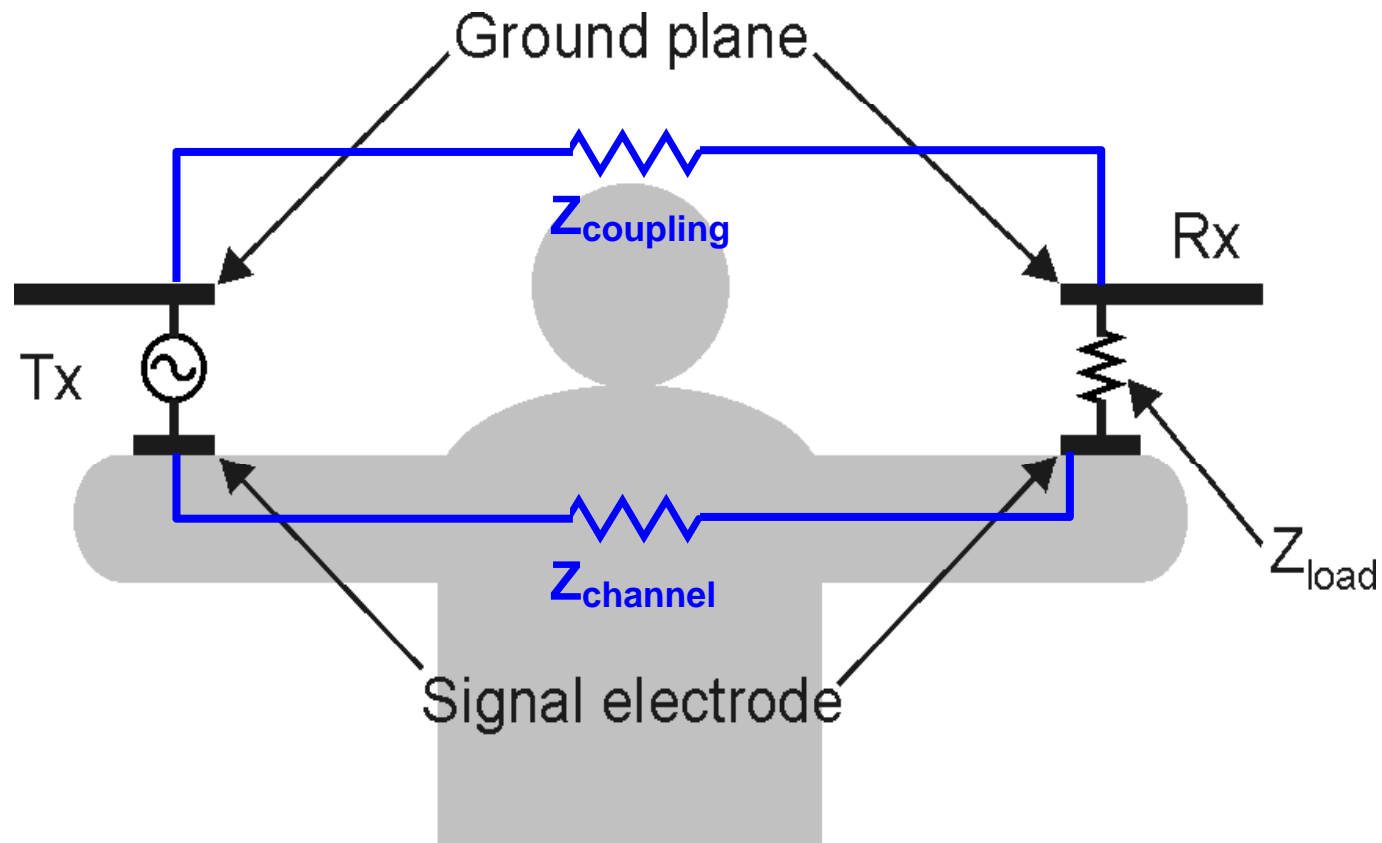# Channel Model for Human Body Communication

2008. 1. 14.

Human Body Communication SoC Team

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Lumped Model
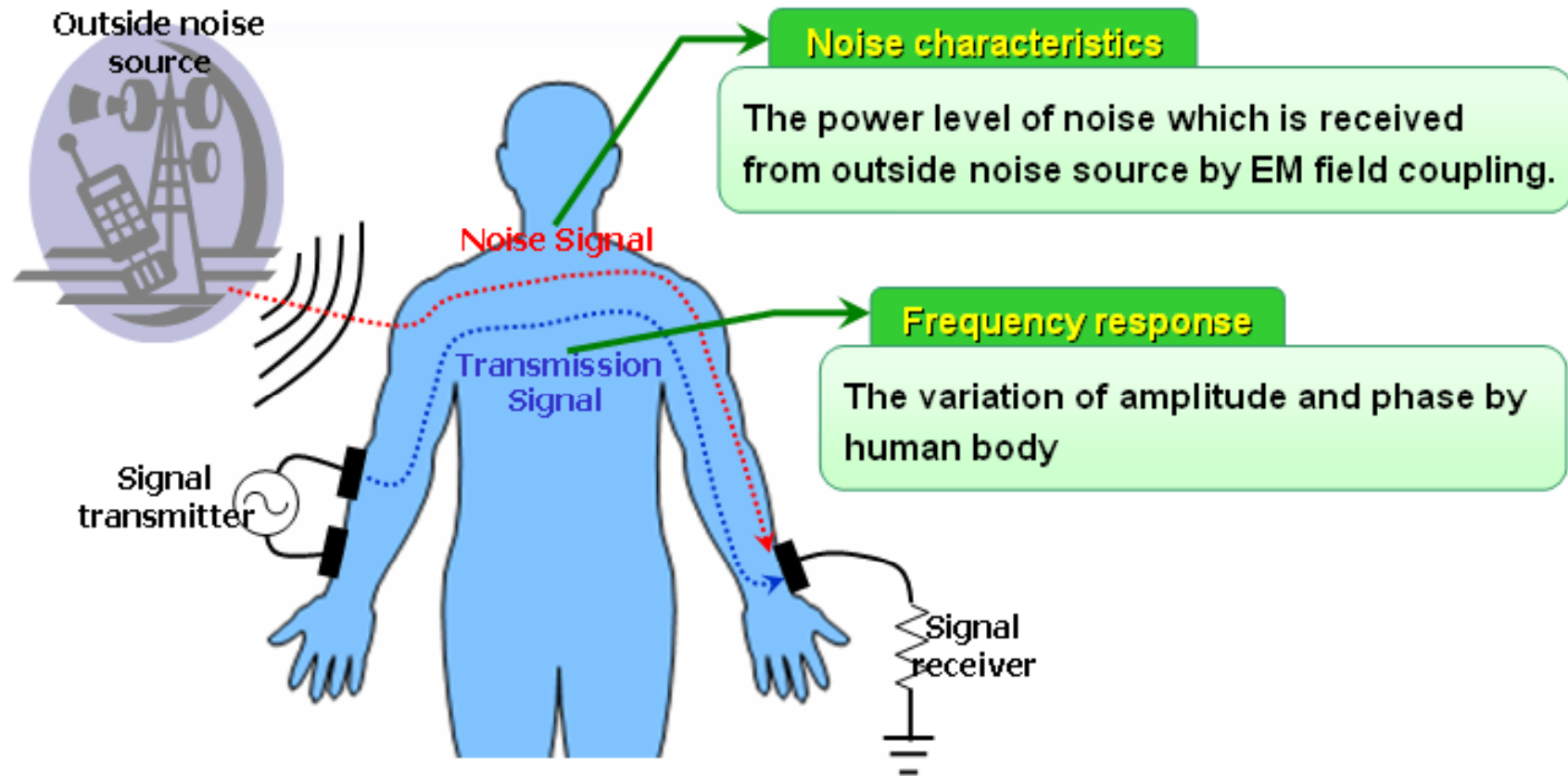
- The human body communication can be modeled with two lumped elements.

Ground plane

$Z_{coupling}$

Rx

Tx

Z_{load}

$Z_{channel}$

Signal electrode

Channel Model for Human Body

- The channel model is composed of the frequency response and the noise characteristics.

Outside noise source

Noise characteristics

The power level of noise which is received from outside noise source by EM field coupling.

Noise Signal

Transmission Signal

Frequency response

The variation of amplitude and phase by human body

Signal transmitter

Signal receiver

Measurement of frequency response

- A signal is transmitted through huamn body and the amplitude and the pahse of receiving signal is measured.

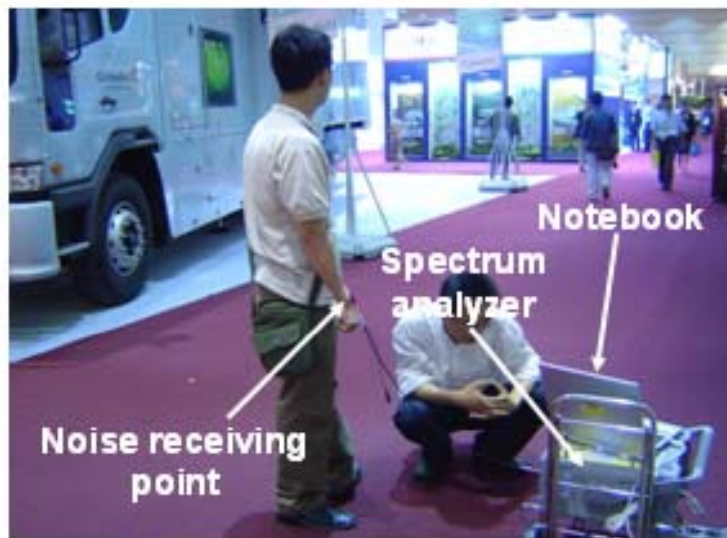Measurement setup

Signal transmitter
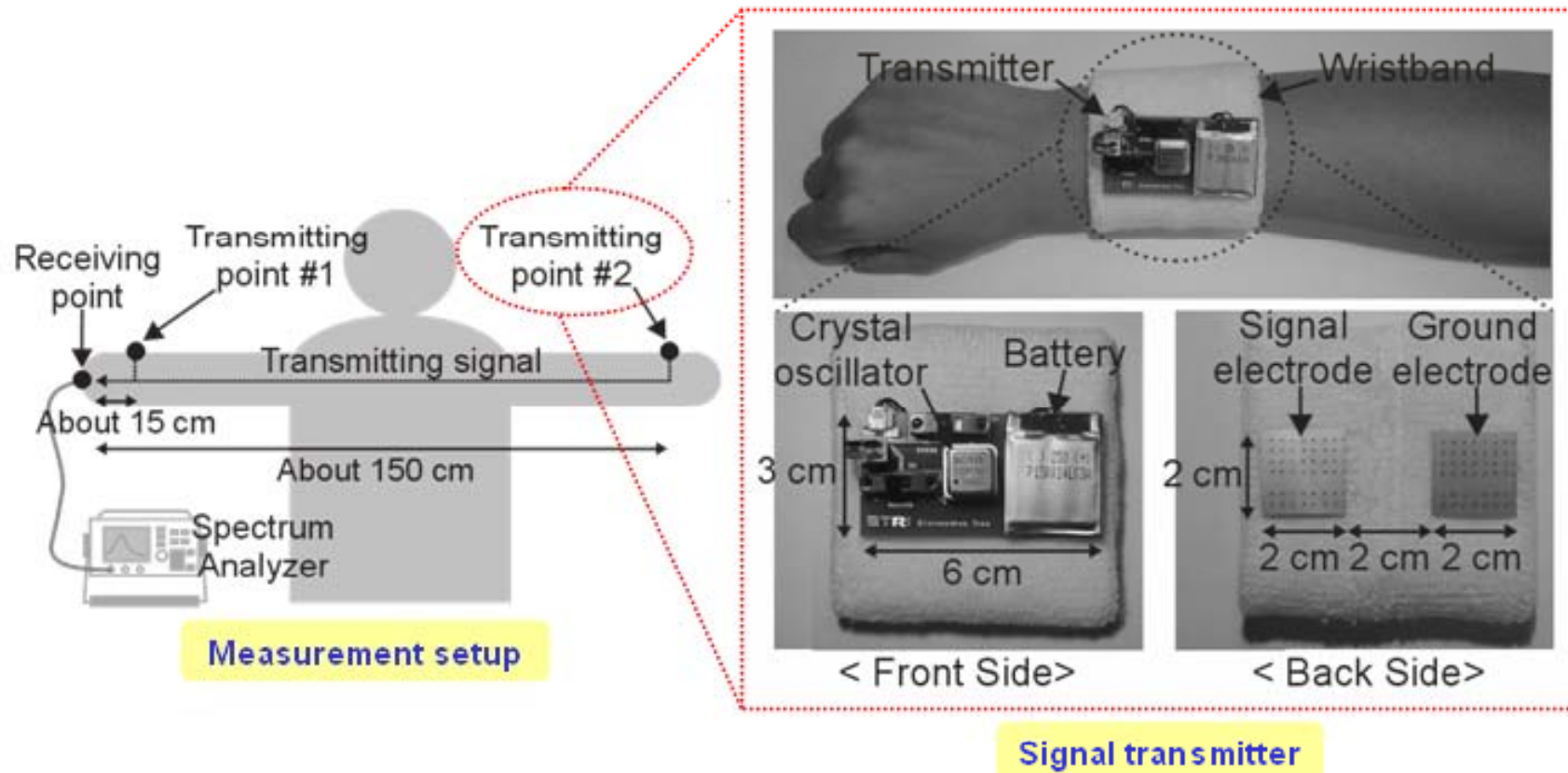
Frquency Response

- The frequency response has been measured with total 10 persons.

- It is different by individual: the amplitude and the phase responses have the deviation range of 10 dB and 20 degree respectively.
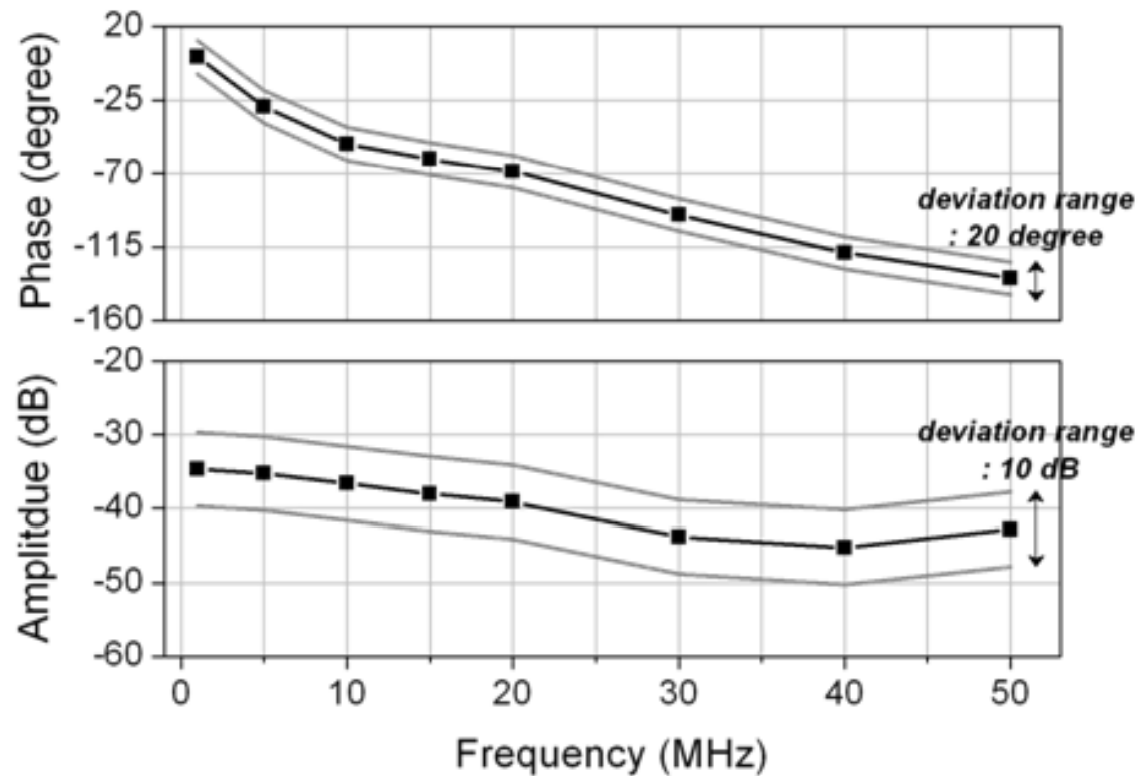
Noise measurement

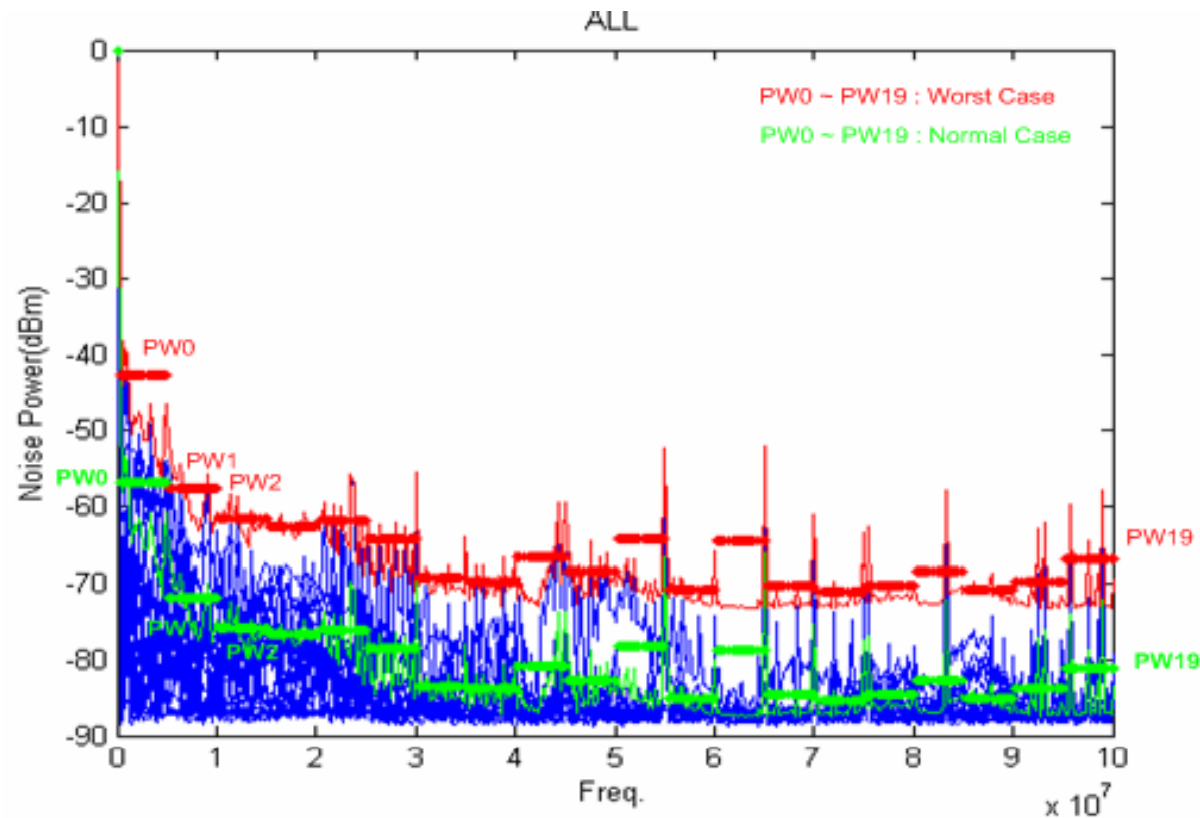- The noise power has been measured where electronic devices are distributed around.

Measurement setup

Exhibition hall

Notebook

Kitchen

PDP TV

Lighting

Noise characteristics

- The measured noise has been classified into worst and normal cases according to its power level and each case has been averaged for the noise profile.

Summary

- In this presentation, the channel model for the human body communication has been introduced.

- The frequency response has a deviation range, so an enough margin is required in the performance of system for the human body communication.

- In the receiver, a noise filter is required for the noise reduction, especially in the low frequency range.