

RRM

Mobile Radio Networks

Handover

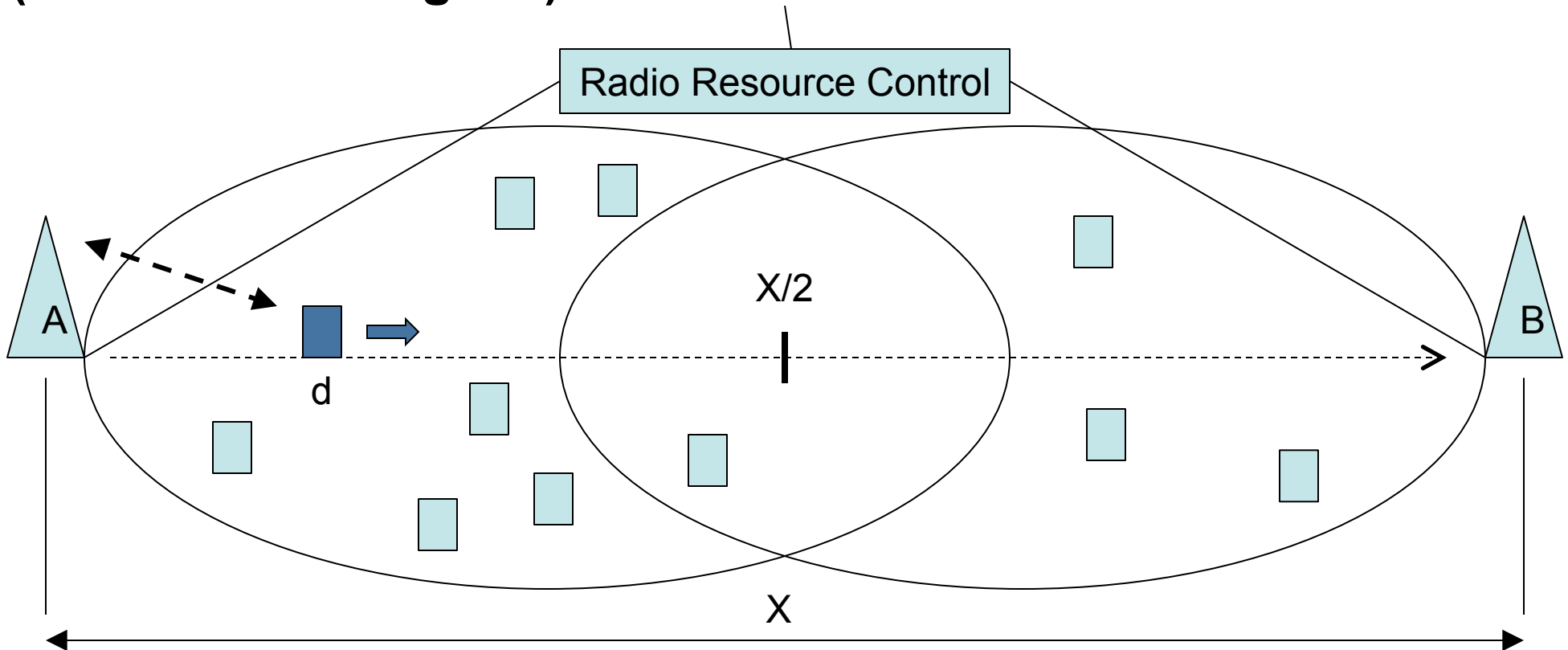
Roberto Verdone
www.robertoverdone.org

1. Handover

Handover

The process of changing *serving* base station.

The mobile station has an *active* / packet data transfer session (i.e. RUs are assigned).



Handover: Categorisation

Hard (Break Before Make)

Soft/Softer (Make Before Break)

Inter-cell

Network Controlled

Mobile Controlled

Mobile Assisted

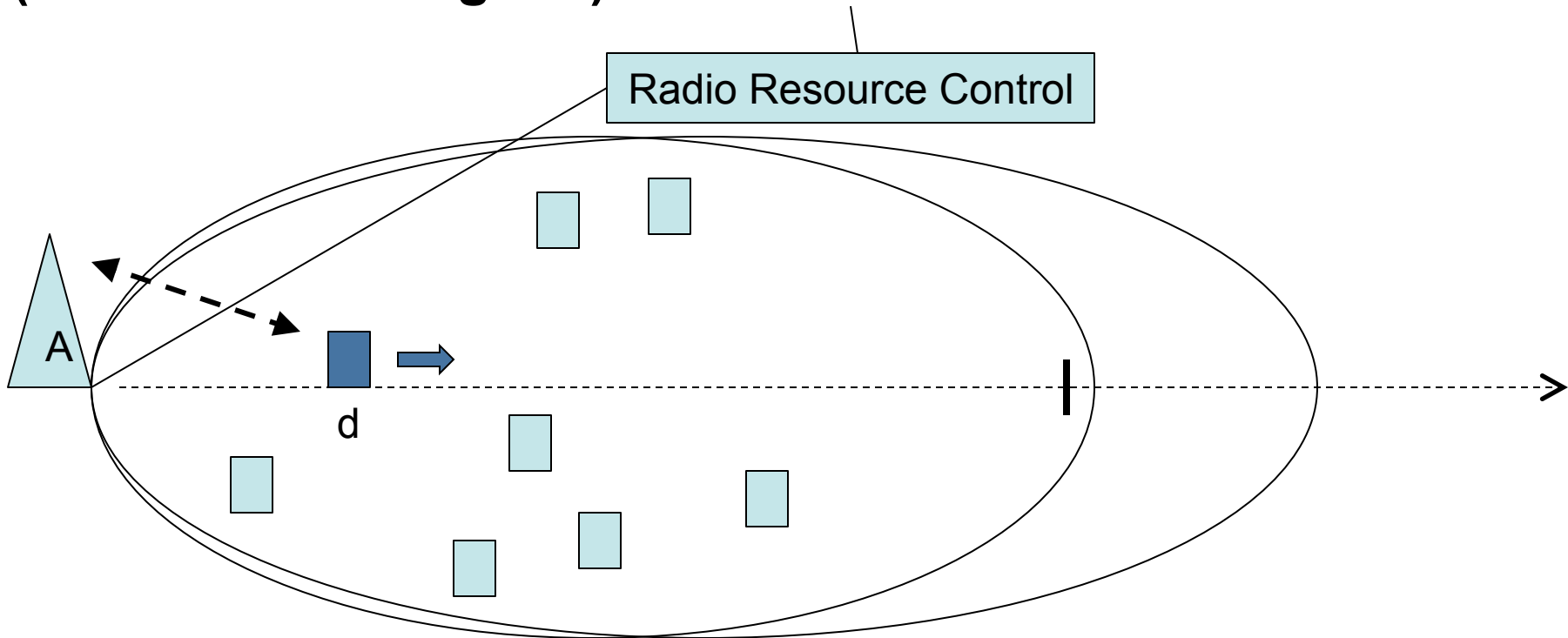
Generated by:

- Radio Link Quality**
 - Network Management**
 - Service Options**
-

Handover

The process of changing frequency band or RAT.

The mobile station has an *active* / packet data transfer session (i.e. RUs are assigned).



Handover: Categorisation

Hard (Break Before Make)

Soft/Softer (Make Before Break)

Inter-cell

Inter-frequency

Inter-RAT

Network Controlled

Mobile Controlled

Mobile Assisted

Generated by:

- Radio Link Quality**
 - Network Management**
 - Service Options**
-

Handover: Steps

1) Measurements

→ Reports

2) Decision

→ Handover algorithm

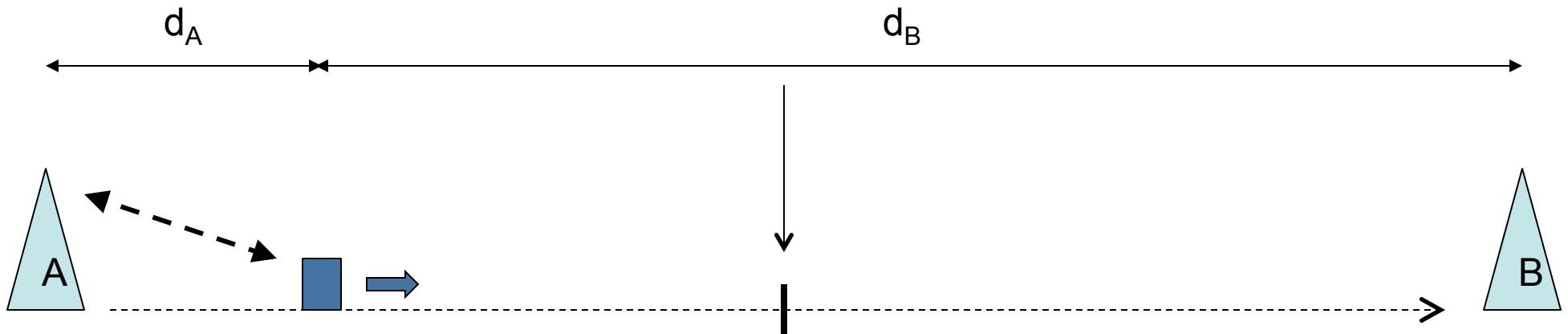
3) Resource Assignment

4) Execution

→ Signalling

Handover: Measurements

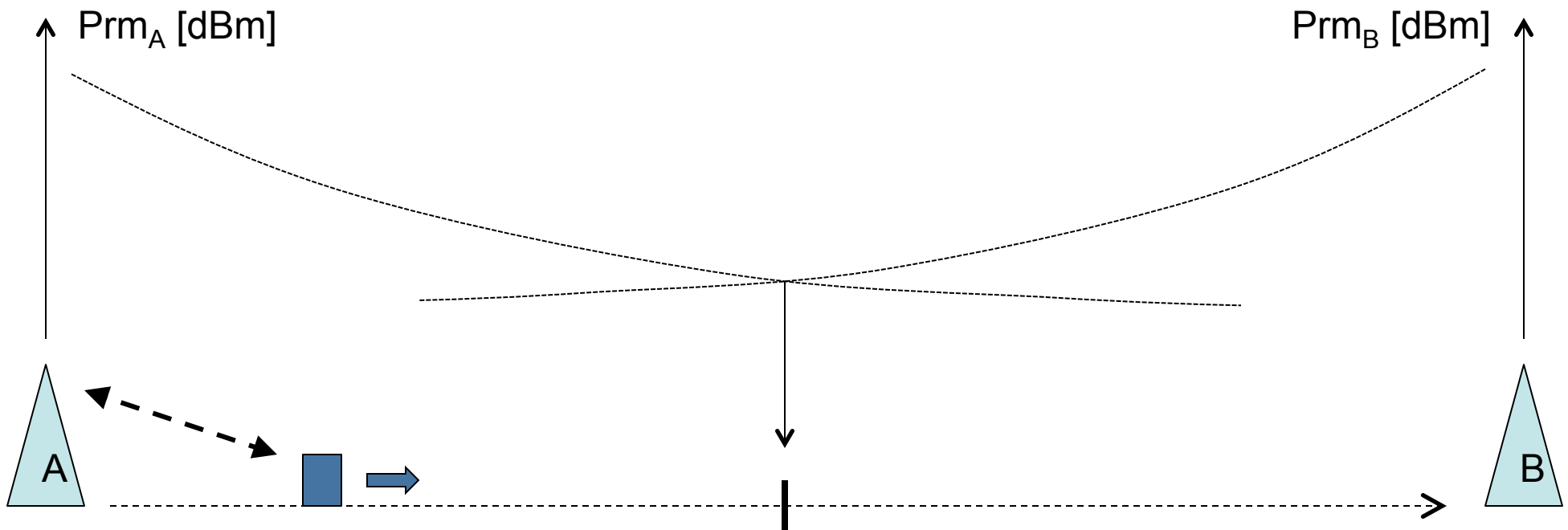
Distance from A and B



Handover: Measurements

Distance from A and B

Received Power from A and B



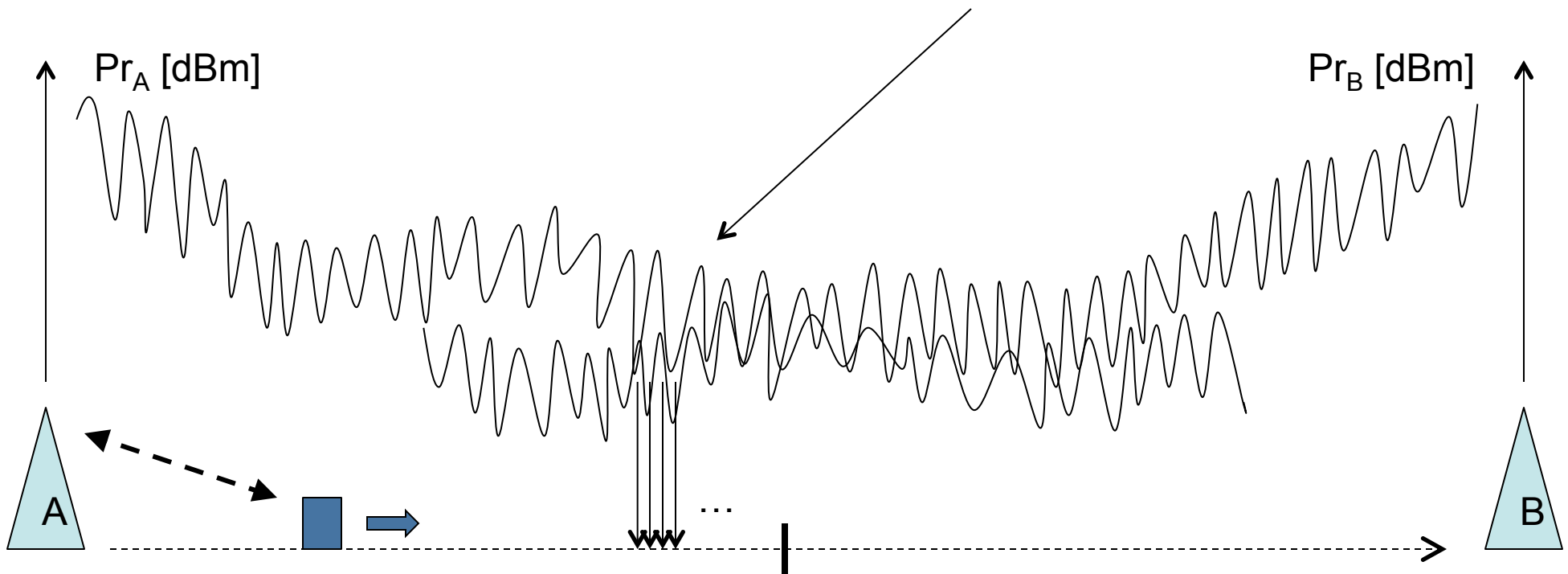
Handover: Measurements

Distance from A and B

Received Power from A and B

- Short term average power

ping-pong effect

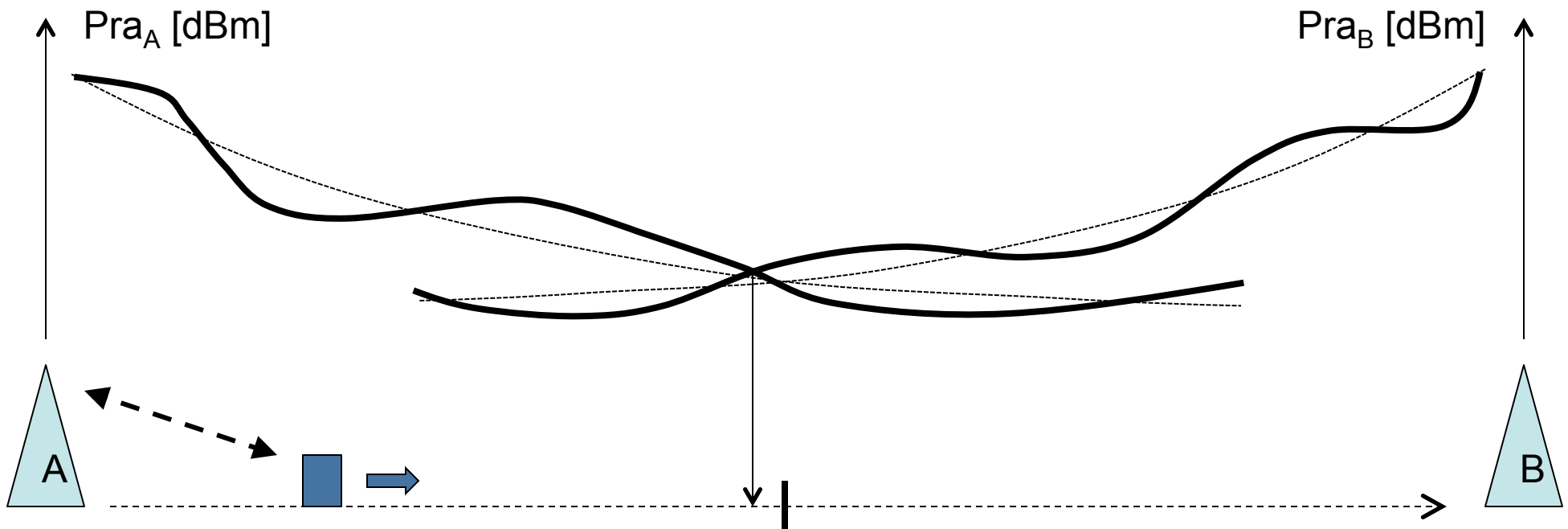


Handover: Measurements

Distance from A and B

Received Power from A and B

- Long term average power

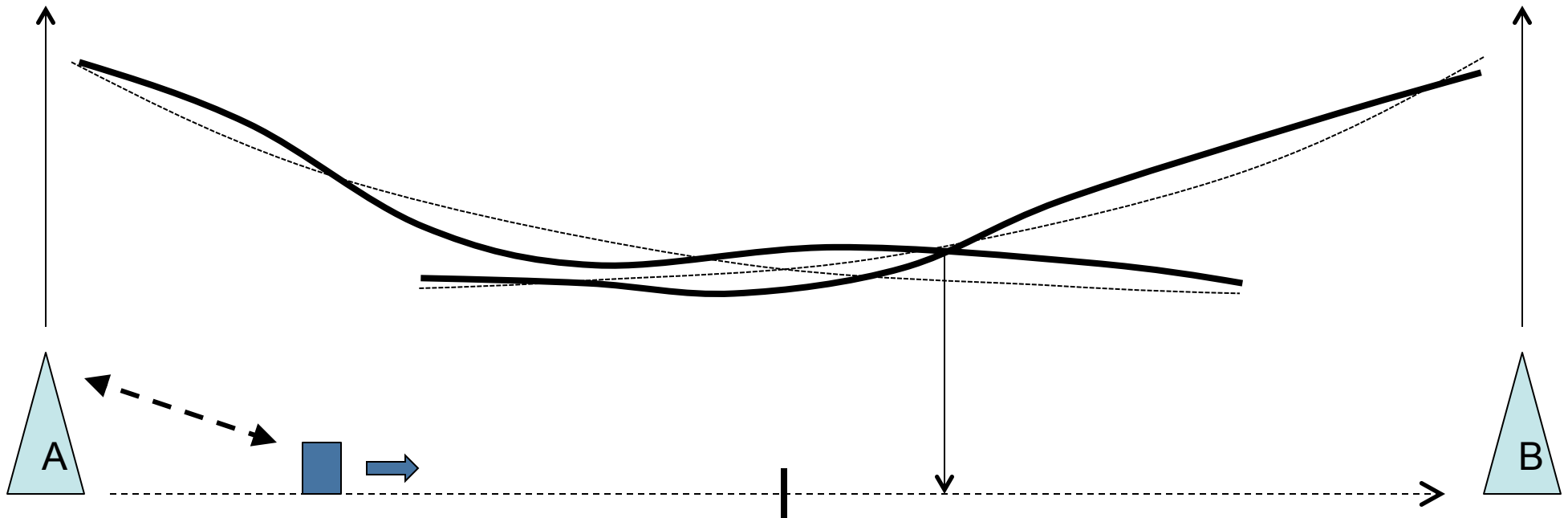


Handover: Decision

AvPr = average over a window of T s of the long term av. Power

$AvPra_A$ [dBm]

$AvPra_B$ [dBm]

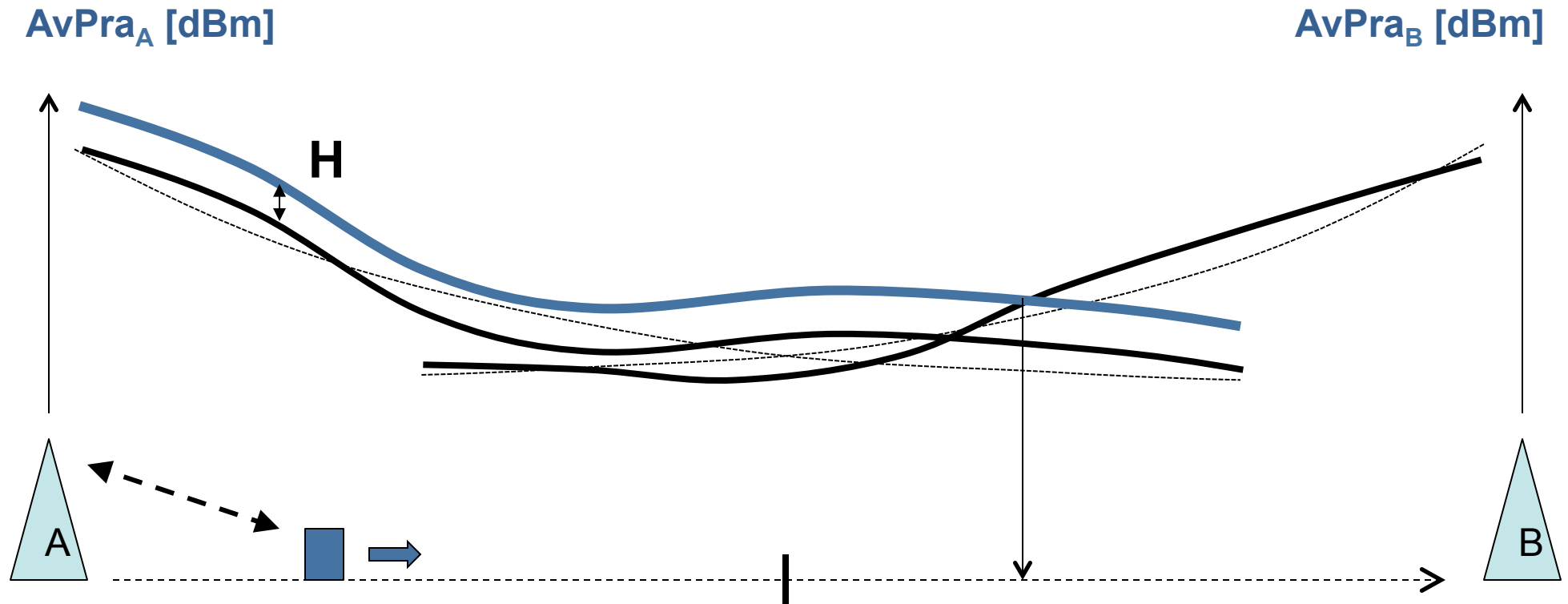


Handover: Decision

AvPr = average over a window of T s of the long term av. power

A → B when $\text{AvPr}_B \text{ [dBm]} > \text{AvPr}_A \text{ [dBm]} + H \text{ [dB]}$

B → A when $\text{AvPr}_A \text{ [dBm]} > \text{AvPr}_B \text{ [dBm]} + H \text{ [dB]}$

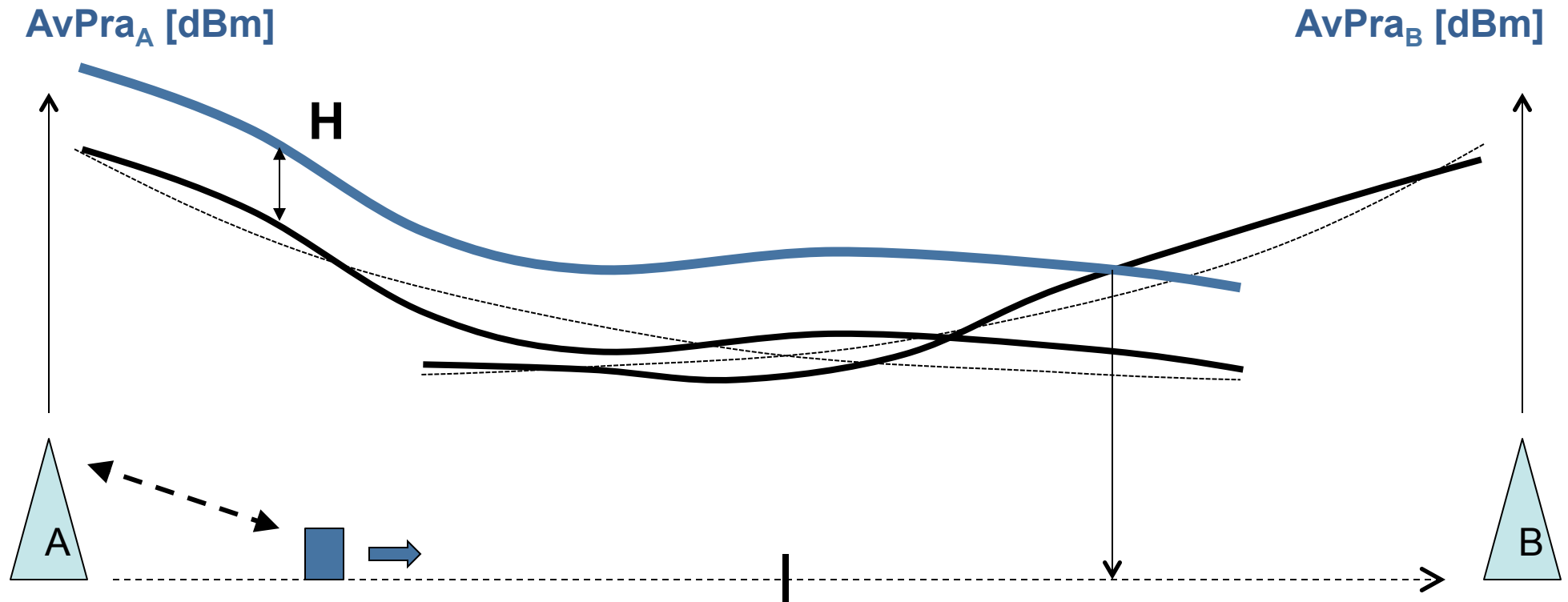


Handover: Decision

AvPr = average over a window of T s of the long term av. power

A → B when $AvPr_B \text{ [dBm]} > AvPr_A \text{ [dBm]} + H \text{ [dB]}$

B → A when $AvPr_A \text{ [dBm]} > AvPr_B \text{ [dBm]} + H \text{ [dB]}$

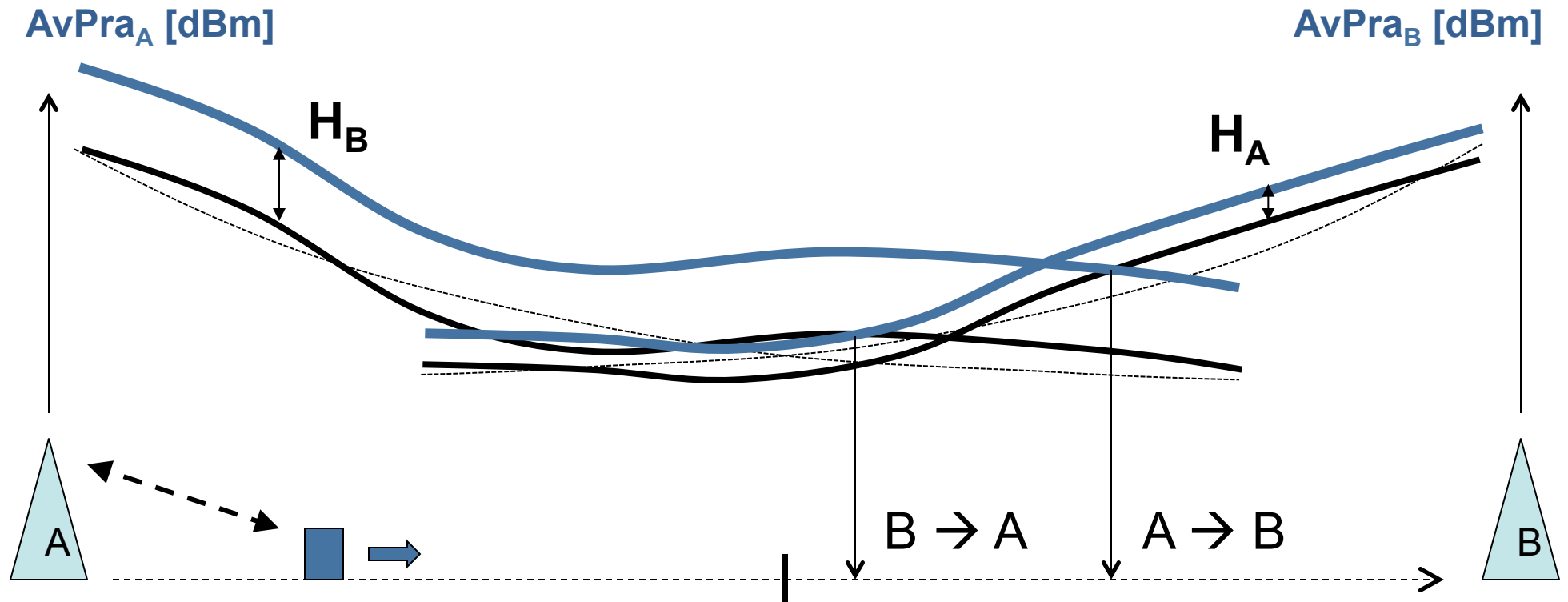


Handover: Decision

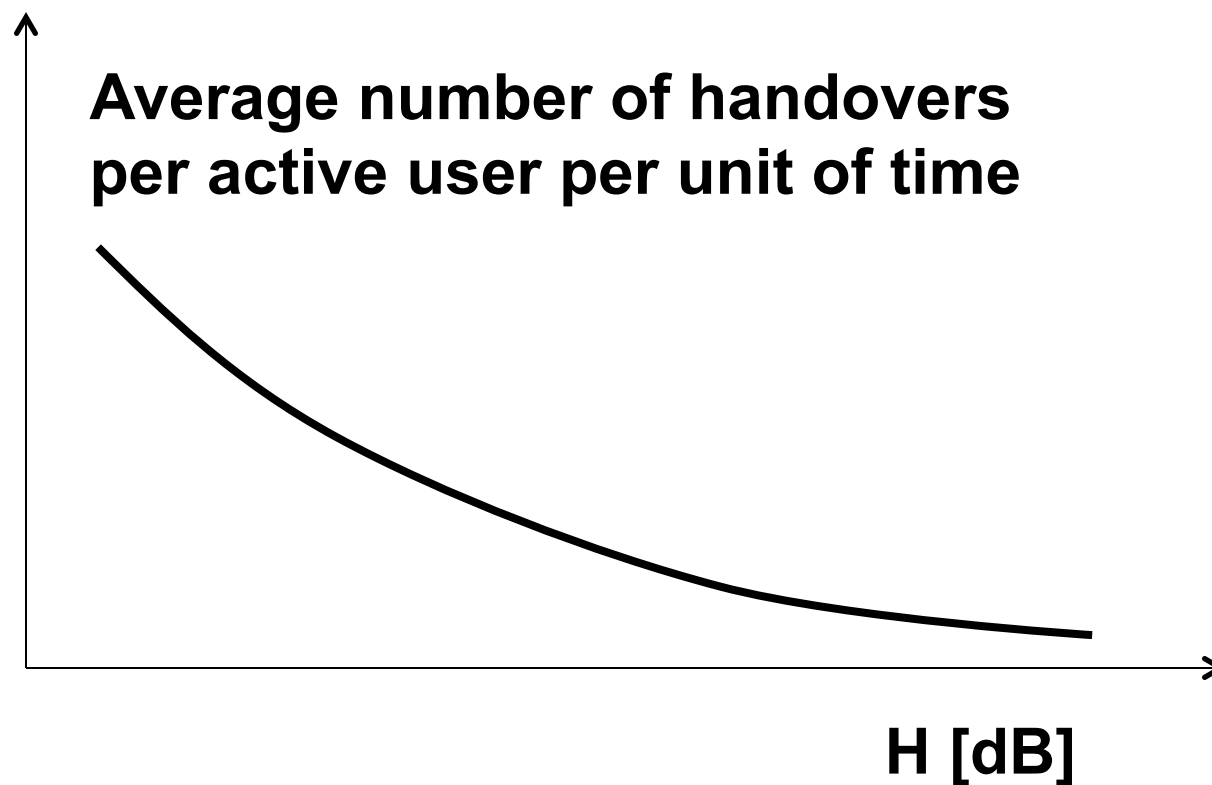
AvPr = average over a window of T s of the long term av. power

A → B when $AvPr_B \text{ [dBm]} > AvPr_A \text{ [dBm]} + H_B \text{ [dB]}$

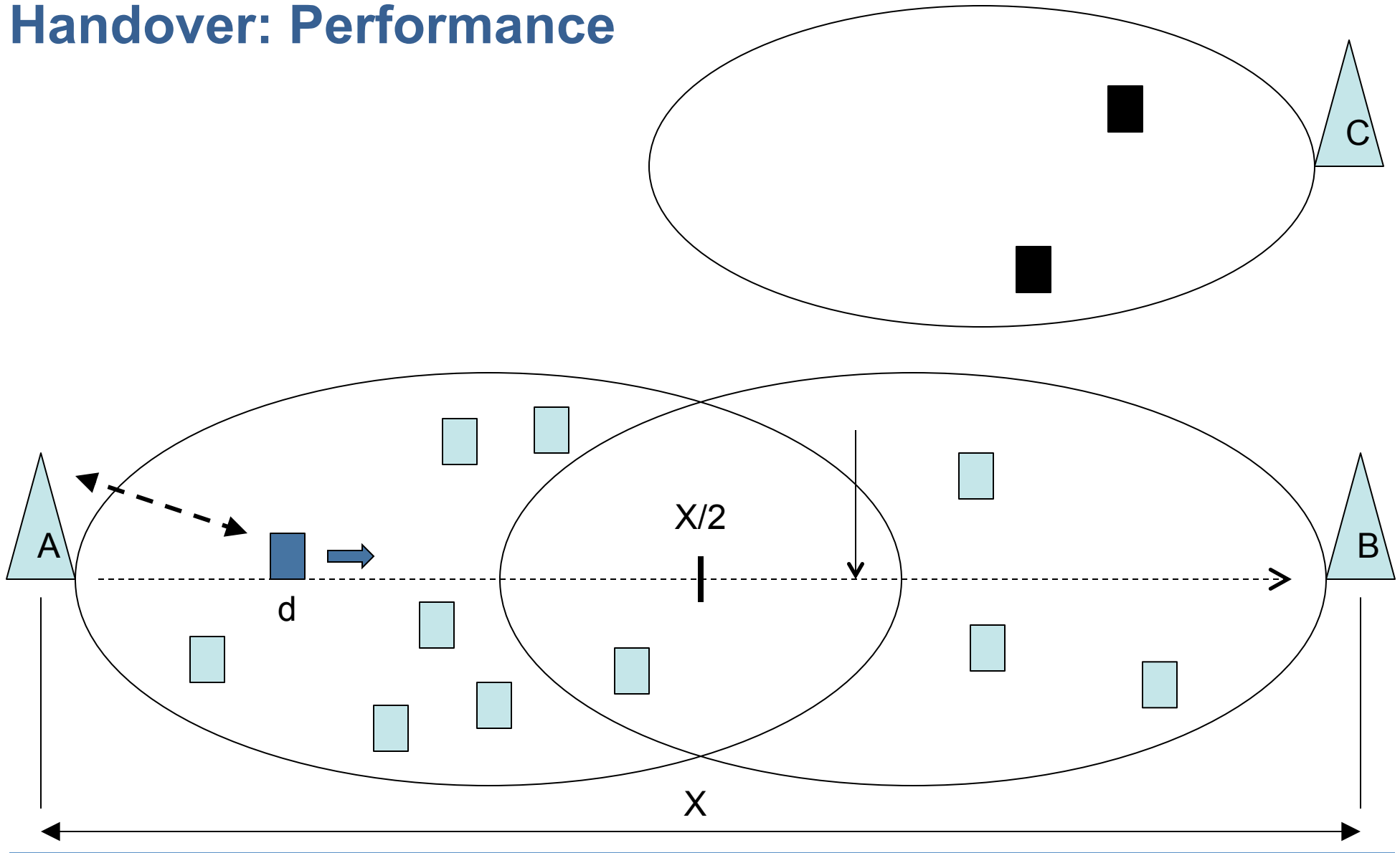
B → A when $AvPr_A \text{ [dBm]} > AvPr_B \text{ [dBm]} + H_A \text{ [dB]}$



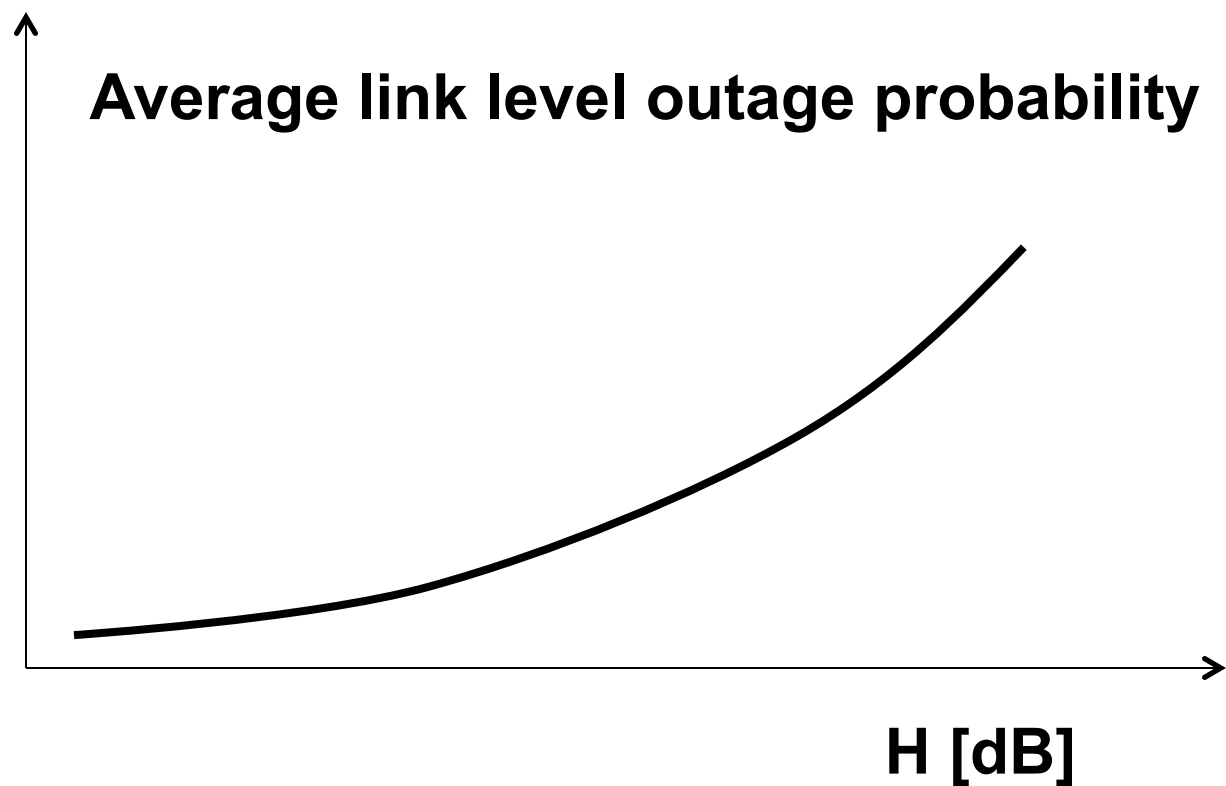
Handover: Performance



Handover: Performance



Handover: Performance



Handover: Decision

AvPr = average over a window of T s of the long term av. power

A → B when $\text{AvPr}_B \text{ [dBm]} > \text{AvPr}_A \text{ [dBm]} + H_B \text{ [dB]}$

B → A when $\text{AvPr}_A \text{ [dBm]} > \text{AvPr}_B \text{ [dBm]} + H_A \text{ [dB]}$

Additional options:

- Thresholds
 - Timeouts
 - ...
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