

**RRM**

# Radio Networks

## RRM: Handover

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# Outline

## 1. Handover

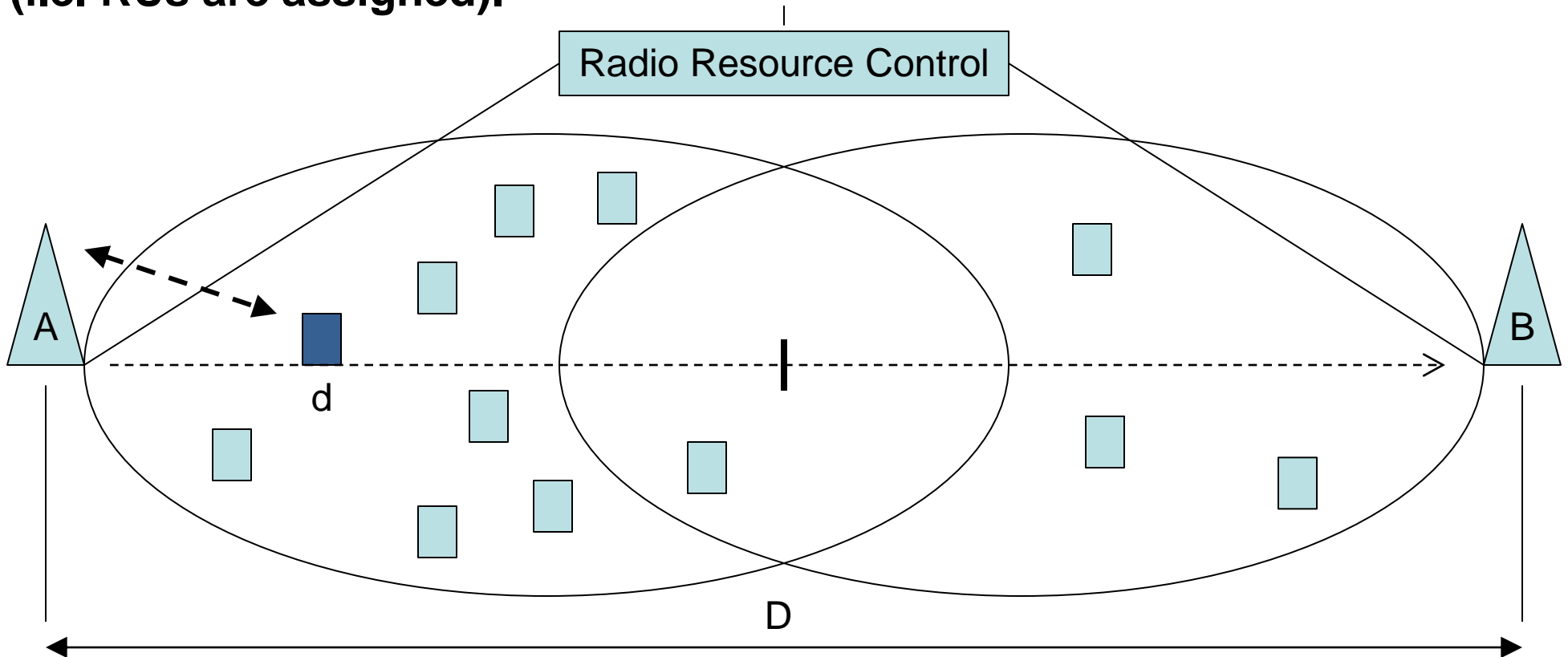
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# 1. Handover

# Handover

The process of changing *serving* base station.

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



# Handover: Categorisation

**Hard (Break Before Make)**

**Soft/Softer (Make Before Break)**

**Inter-cell or Intra-cell (GSM)**

**Network Controlled**

**Mobile Controlled**

**Mobile Assisted**

**Generated by:**

- Radio Link**
  - Network Management**
  - Service Options**
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## Handover: Steps

- 1) Measurements → Reports
  - 2) Decision → Handover algorithm
  - 3) Resource Assignment
  - 4) Execution → Signalling
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# Handover: Measurements

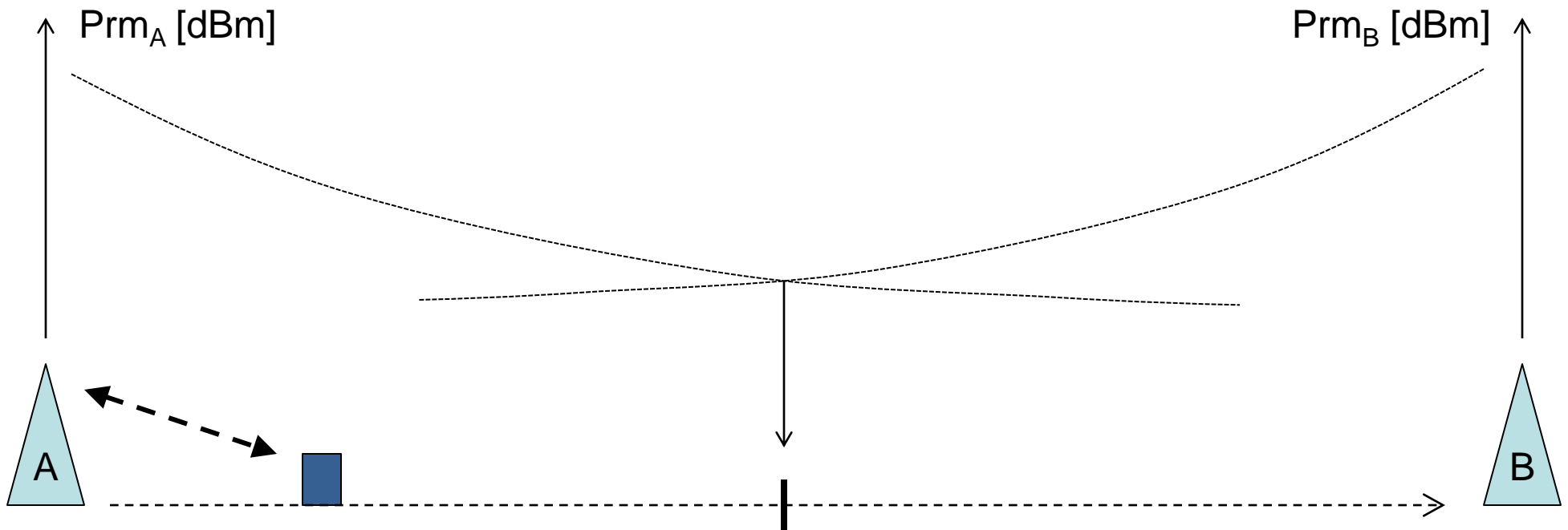
## Distance from A and B



# Handover: Measurements

Distance from A and B

Received Power from A and B



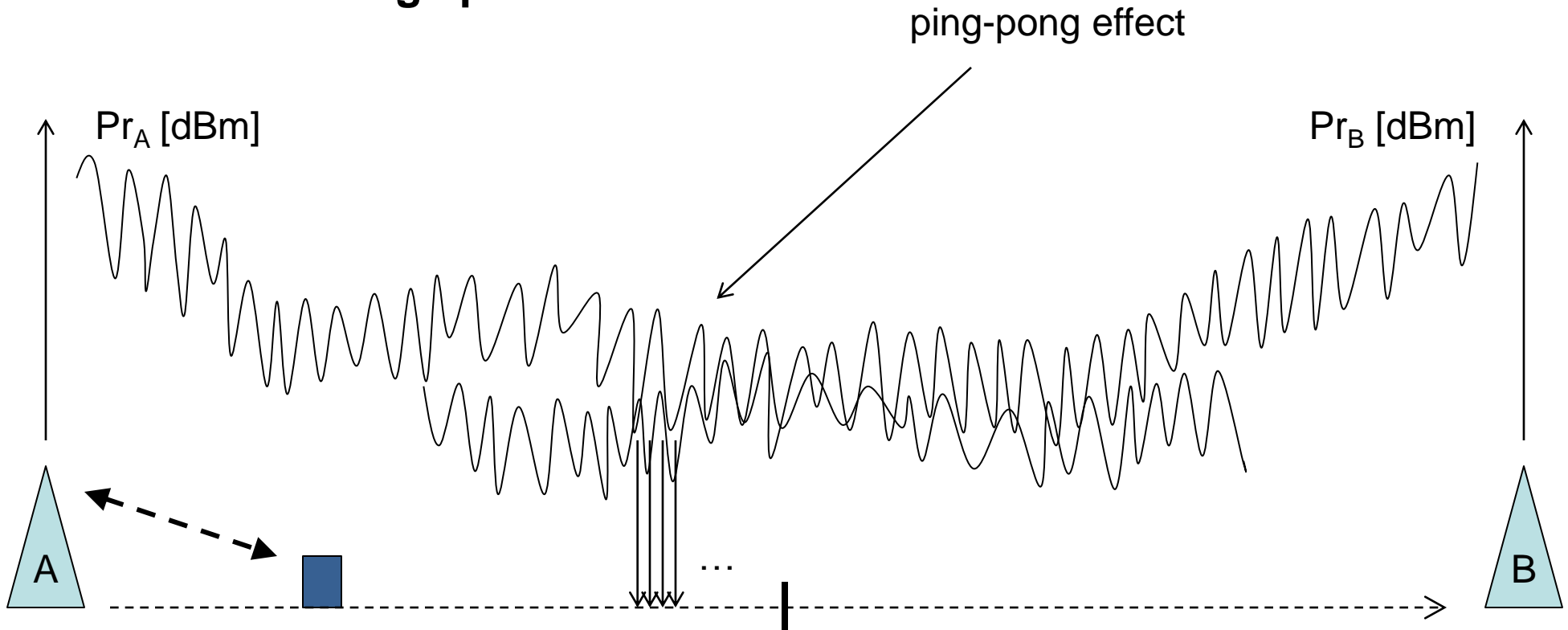


# Handover: Measurements

Distance from A and B

Received Power from A and B

- Short term average power

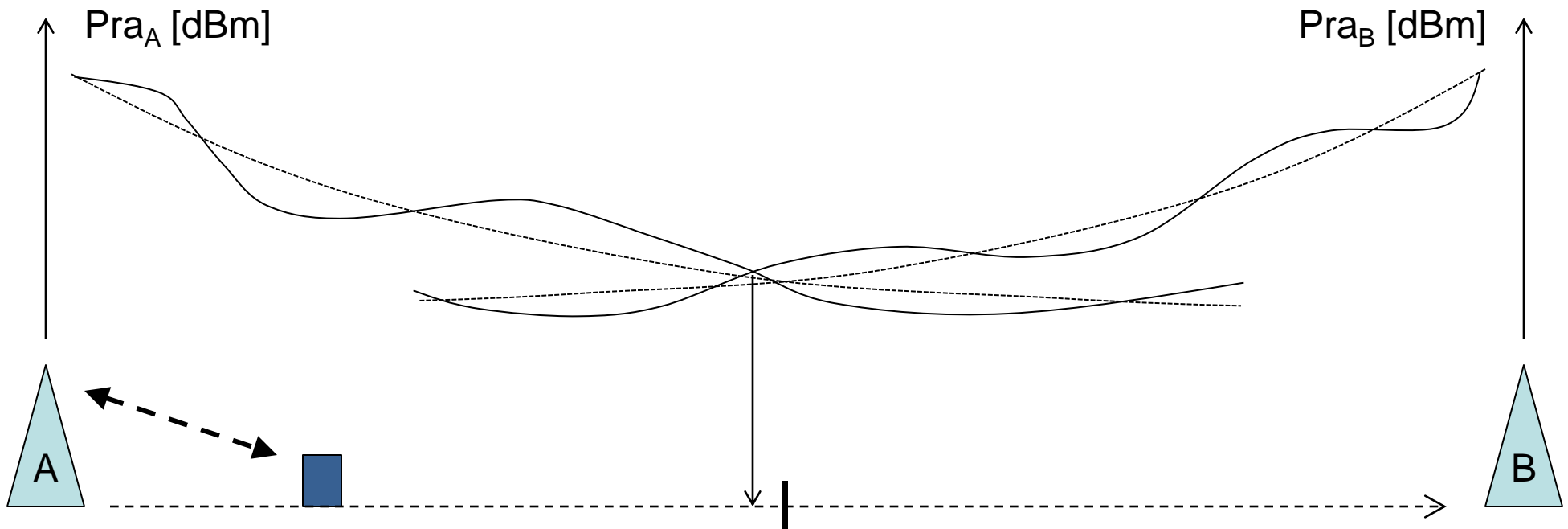


# Handover: Measurements

Distance from A and B

Received Power from A and B

- Short term average power
- Long term average power



# Handover: Decision

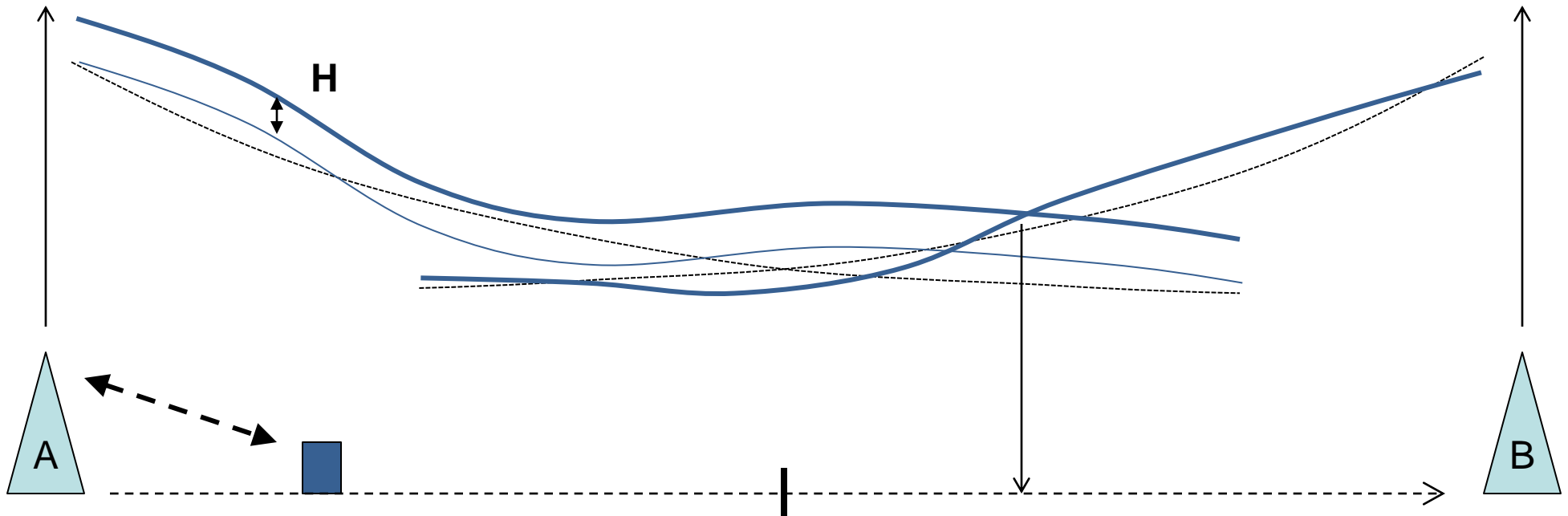
**AvPr = average over a window of T sec of the long term average power**

**A → B when  $AvPr_B [dBm] > AvPr_A [dBm] + H [dB]$**

**B → A when  $AvPr_A [dBm] > AvPr_B [dBm] + H [dB]$**

AvPr<sub>A</sub> [dBm]

AvPr<sub>B</sub> [dBm]



# Handover: Decision

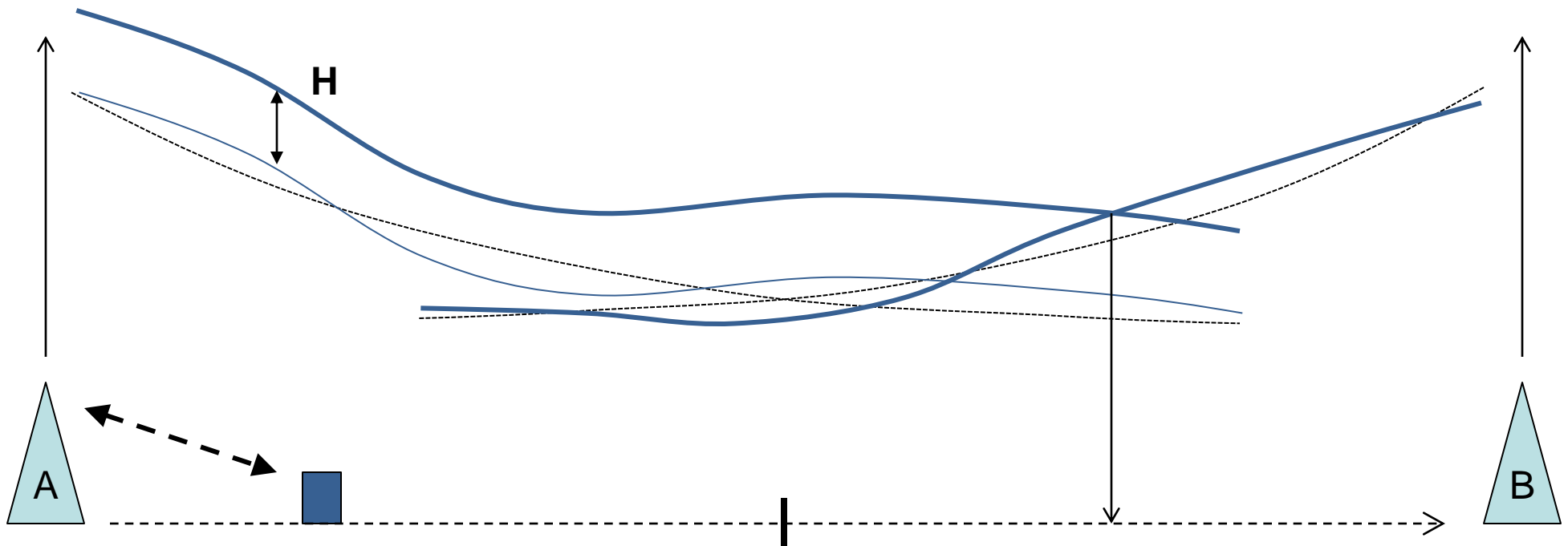
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# Handover: Decision

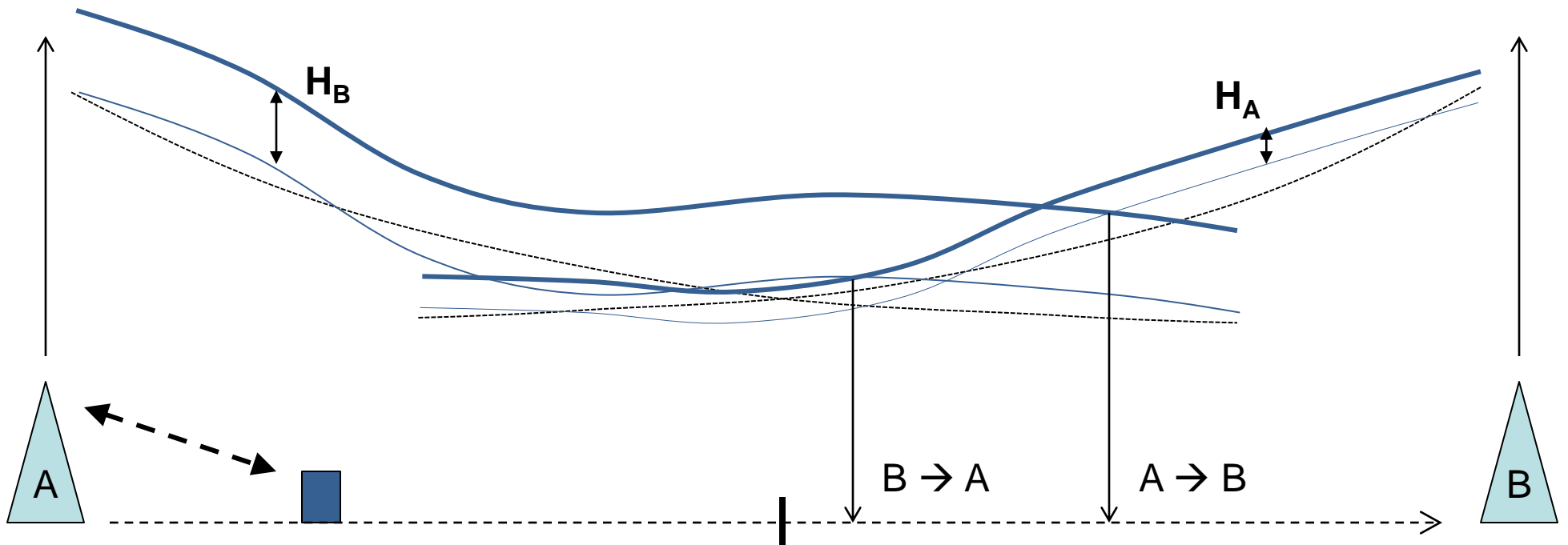
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AvPr<sub>A</sub> [dBm]

AvPr<sub>B</sub> [dBm]



## Handover: Decision

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

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

**Additional options:**

- Thresholds
  - Timeouts
  - ...
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