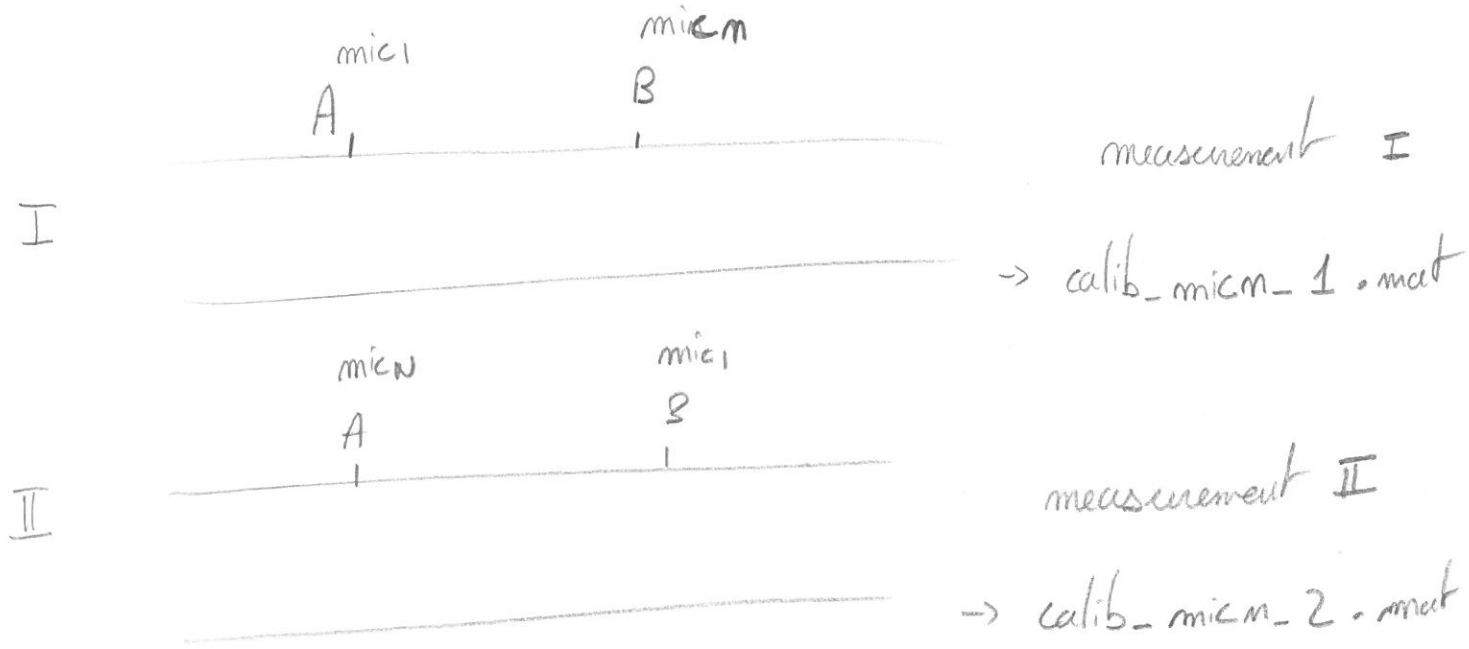
Kundt tube, microphone relative calibration



$$\frac{P_{A\,I}}{P_{B\,I}} = \frac{P_{A\,II}}{P_{B\,II}}$$

$$P_{AI} = P_{1,I} \qquad P_{BI} = g_m P_{m,I}$$

$$P_{A\,II} = g_m P_{m,II} \qquad P_{B\,II} = P_{1,II}$$

$$\Rightarrow \frac{P_{1,I}}{g_m P_{m,I}} = g_m \frac{P_{m,II}}{P_{1,II}}$$

$$H_I = \frac{P_{1,I}}{P_{m,I}} \qquad H_{II} = \frac{P_{1,II}}{P_{m,II}}$$

$$\Rightarrow \boxed{g_m = \sqrt{H_I \; H_{II}}}$$

: relative gain of mic m compared to mic 1