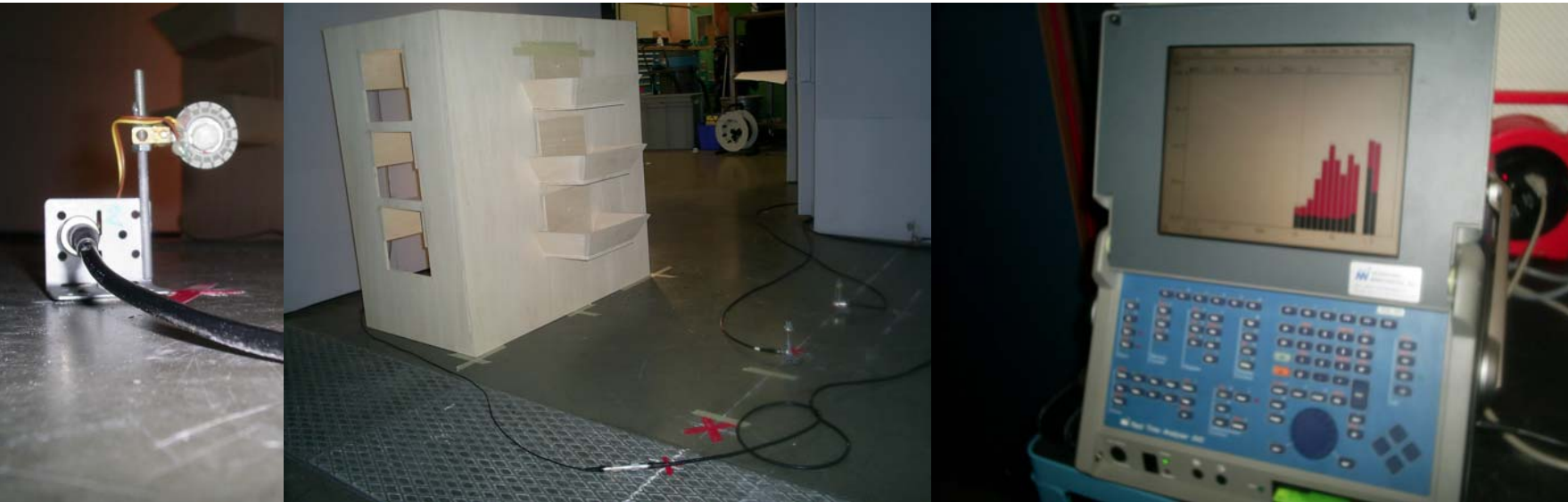


Lärmmessungen am Modell

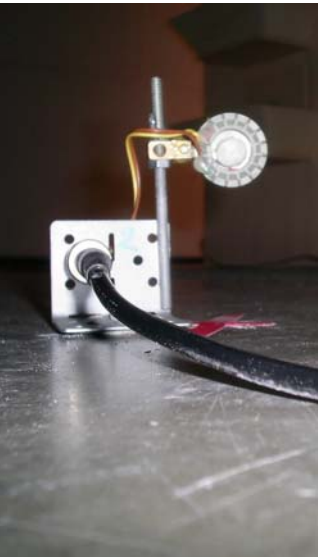


Einfluss von Balkonen und Loggien auf Verkehrslärmimmissionen

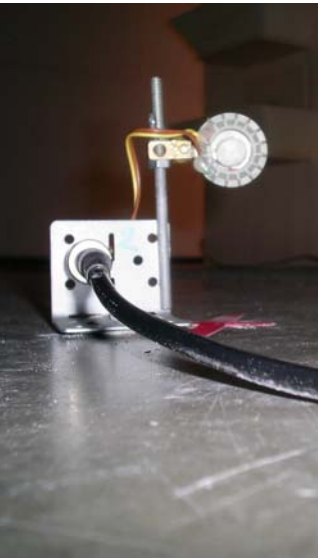
CAS Akustik, Fachhochschule Nordwestschweiz Muttenz
Petra Panzer und Ursula Ott

Modellaufbau

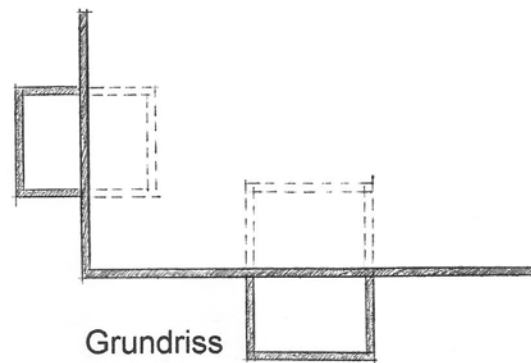
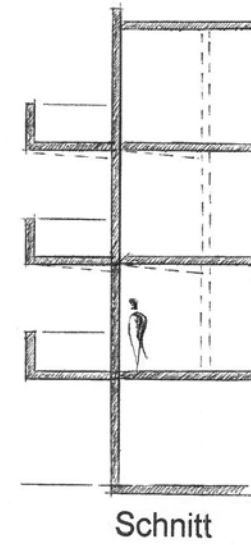
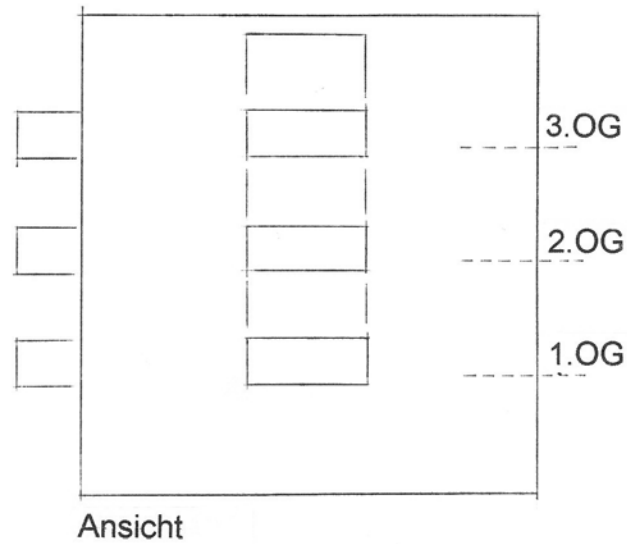
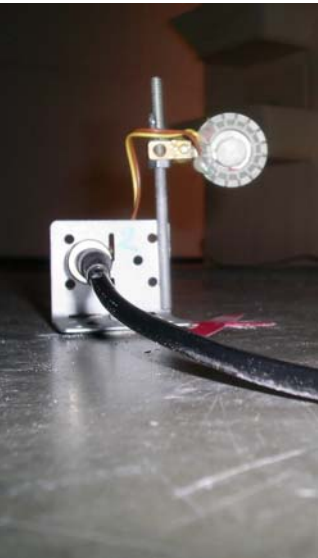
- Massstab 1:16
- Material: Sperrholz
- Länge 12 m und Breite 7 m
- 4 geschossiges Gebäude
- Gebäude mit Längsseite zur Lärmquelle
- Balkone bzw. Loggien parallel und seitlich zur Lärmquelle
- Brüstungshöhe: 1 m

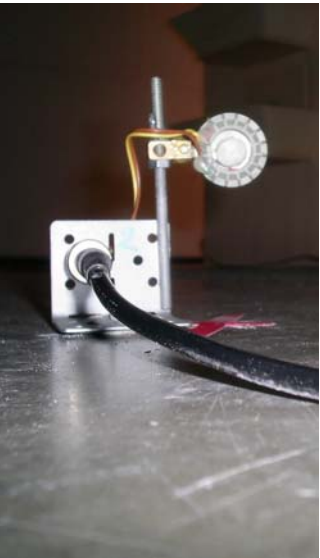


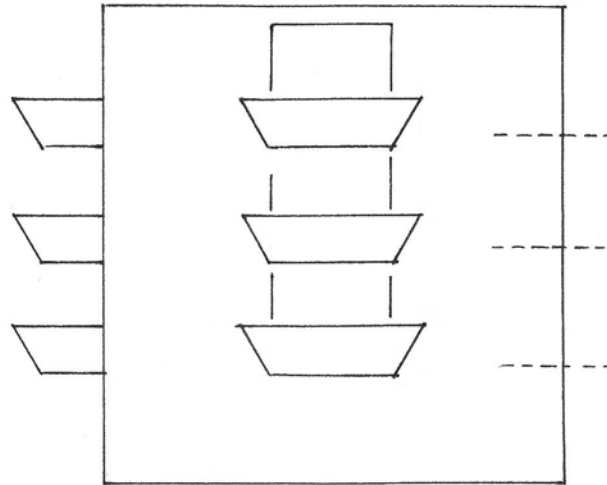
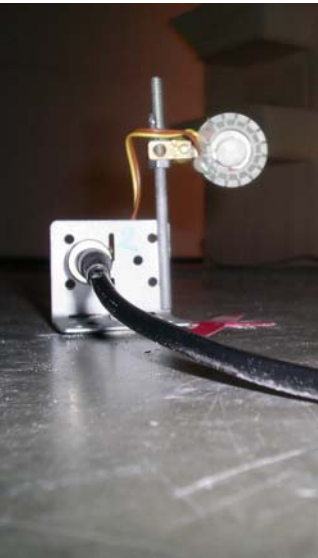
Modellaufbau



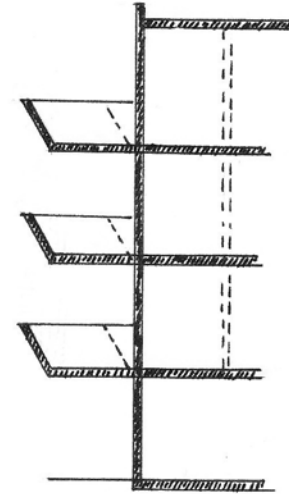
- parallel stehende Balkone/ Loggien: 3 x 2 m
- seitliche Balkone/ Loggien: 2 x 1.5 m
- Messhöhe des Empfangspunktes: 1.5 m



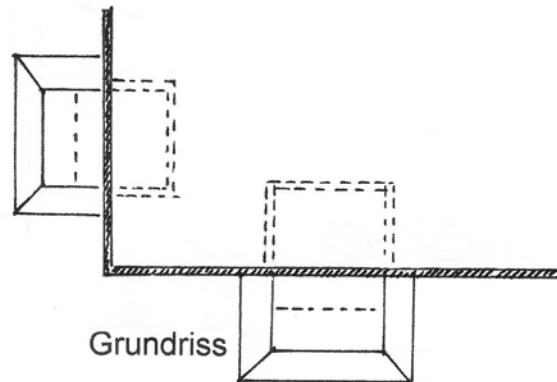




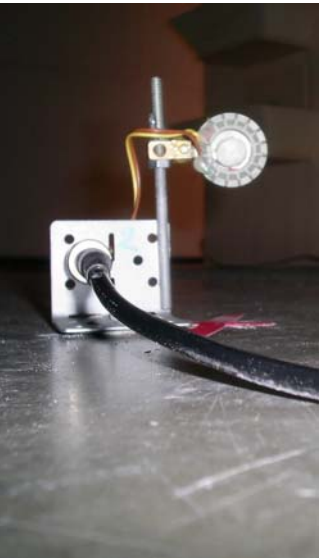
Ansicht



Schnitt

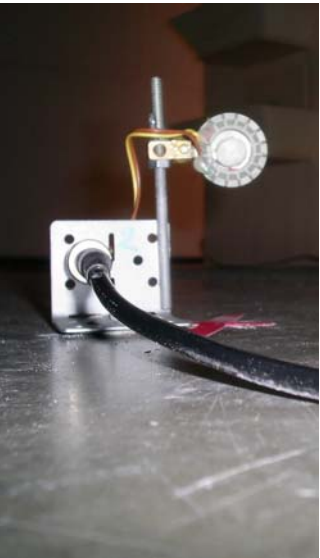


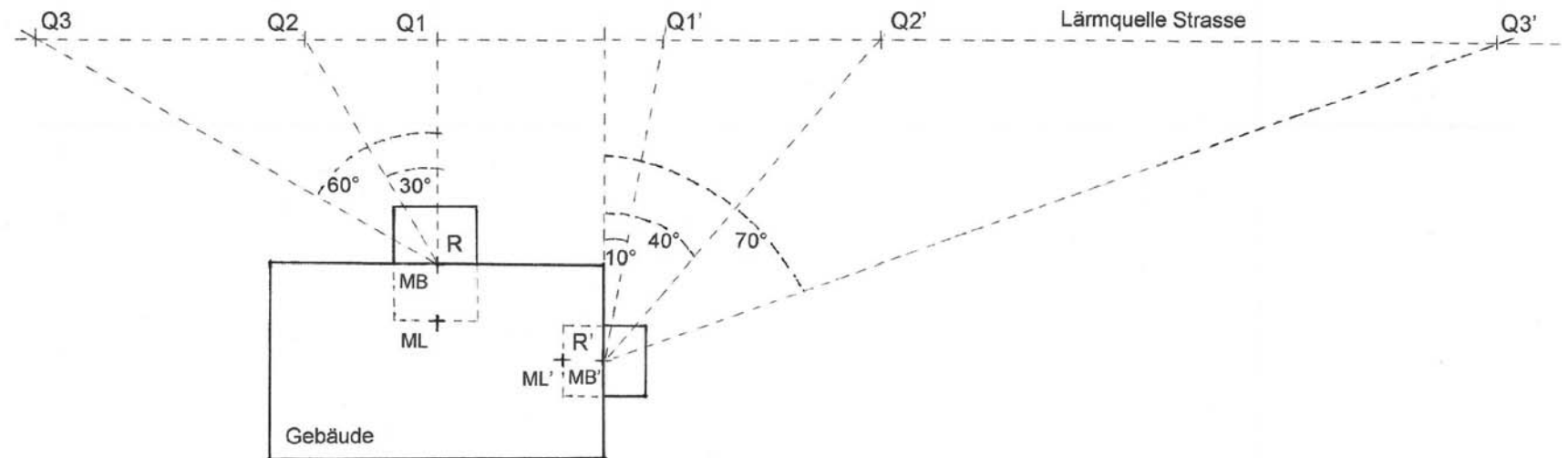
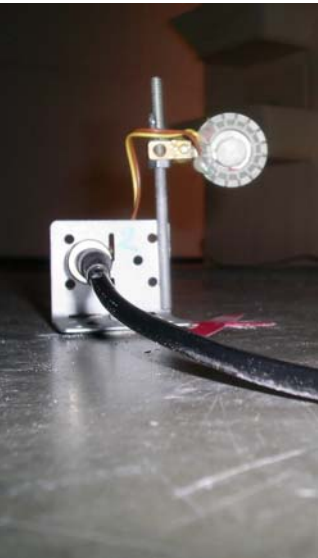
Grundriss

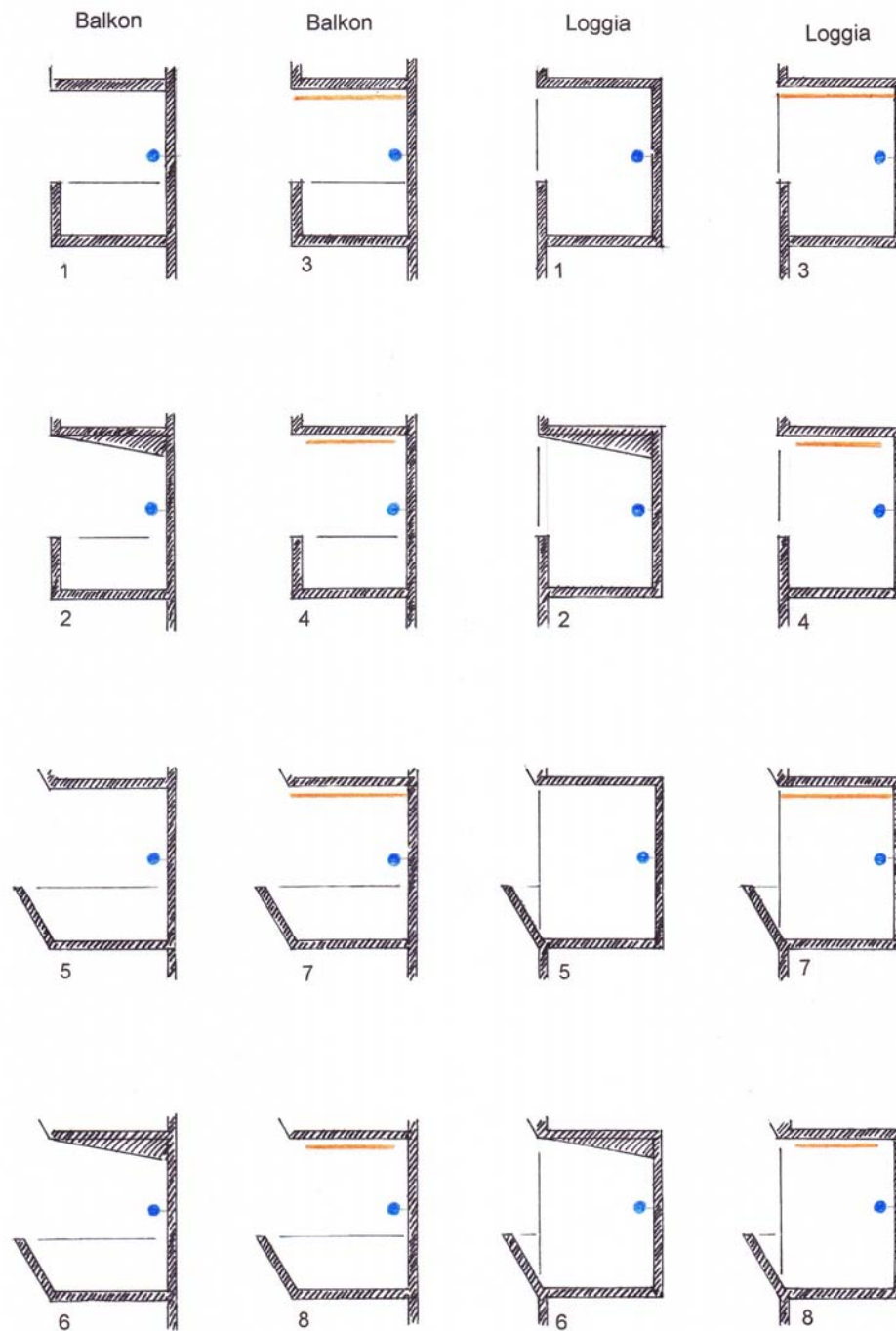
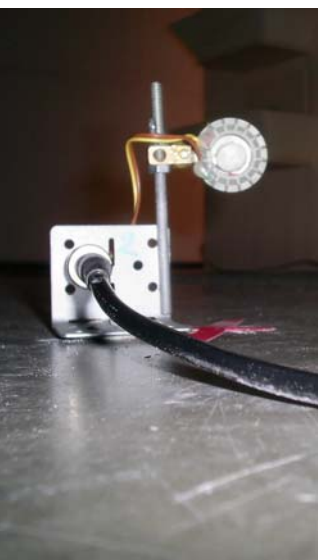


Vorgehen

- Lärmquelle: 3 Lautsprecher
- Distanz zur Lärmquelle: 10 m
- Quellenhöhe: 80 cm
- Lärmquelle in Segmente unterteilt

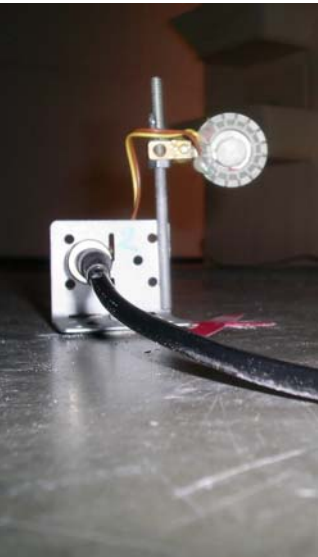




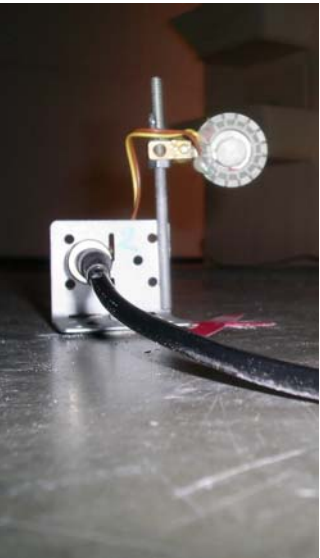


Konstellationen

1. Brüstung lotrecht
2. 10° geneigte Decke
3. schallabsorbierendes Material 100% an Decke
4. schallabsorbierendes Material 64% an Decke
5. 30° geneigte Brüstung
6. 30° geneigte Brüstung, 10° geneigte Decke
7. 30° geneigte Brüstung, schallabsorbierendes Material 100% an Decke
8. 30° geneigte Brüstung, schallabsorbierendes Material 64% an Decke

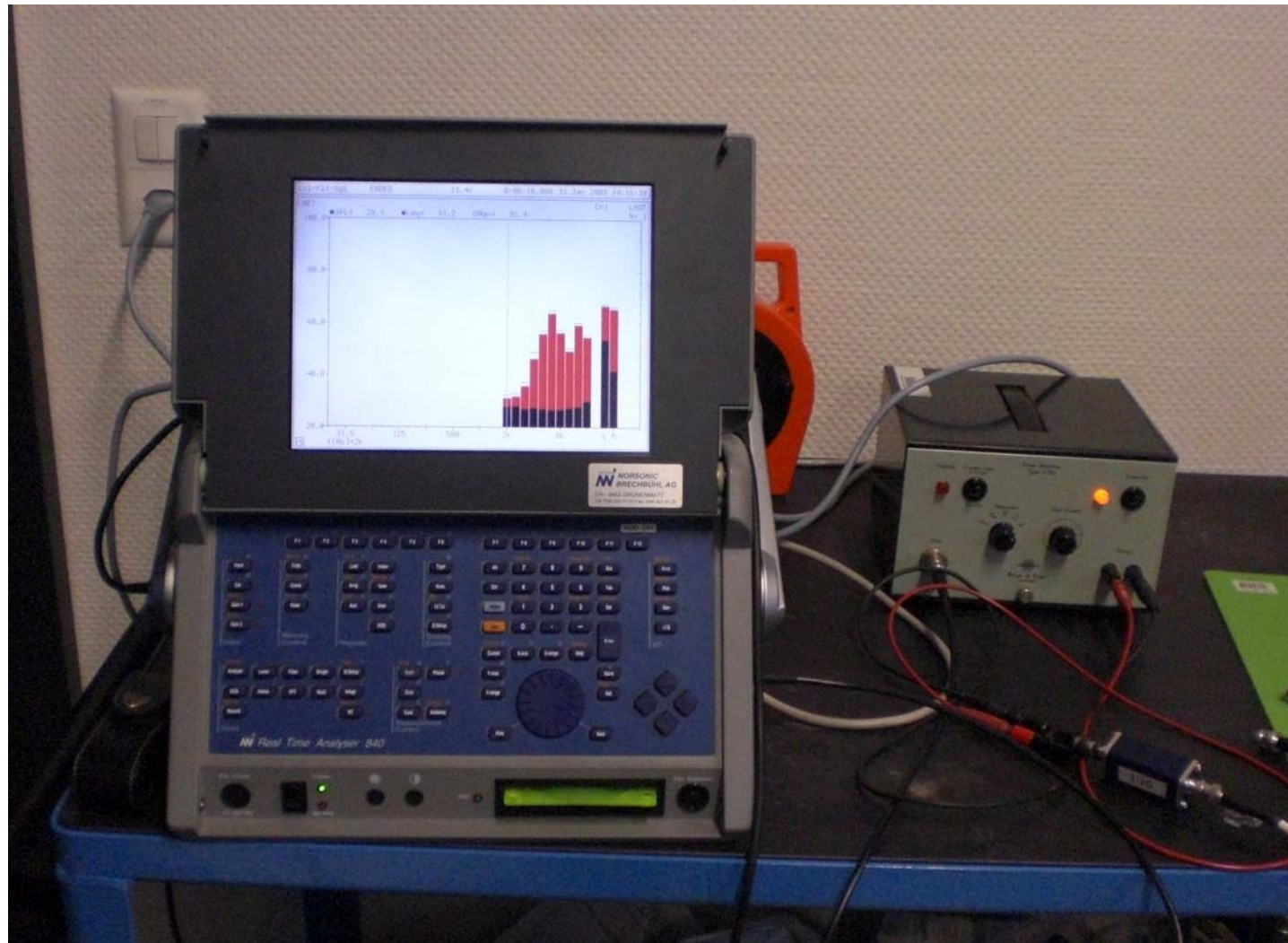
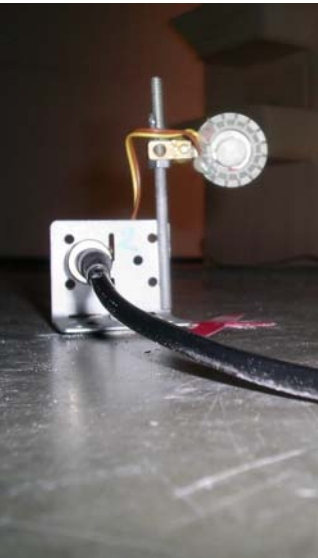


Varianten

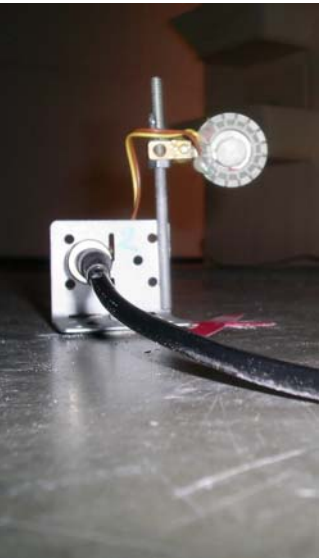


- A. Balkone an der Frontfassade im 1. OG, 2. OG und 3. OG (im 3. OG entfallen Massnahmen für Decke)
- B. Loggien an der Frontfassade im 1. OG, 2. OG und 3. OG
- C. Balkone an der Seitenfassade im 1. OG, 2. OG und 3. OG (im 3. OG entfallen Massnahmen für Decke)
- D. Loggien an der Seitenfassade im 1. OG, 2. OG und 3. OG
- E. Balkon, kleinere Grundfläche an der Frontfassade im 1. OG, 2. OG und 3. OG (im 3. OG entfallen Massnahmen für Decke)
- F. Loggia, kleinere Grundfläche an der Frontfassade im 1. OG, 2. OG und 3. OG

Messinstrumente und Berechnungsverfahren

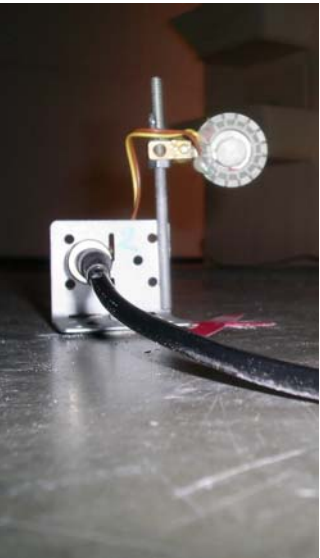


Messinstrumente und Berechnungsverfahren

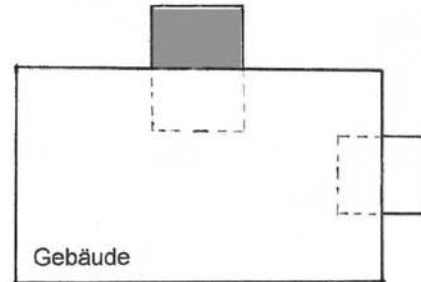
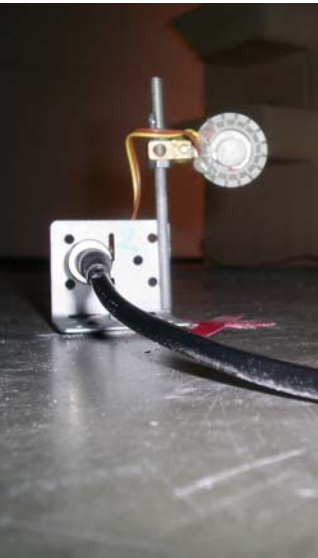


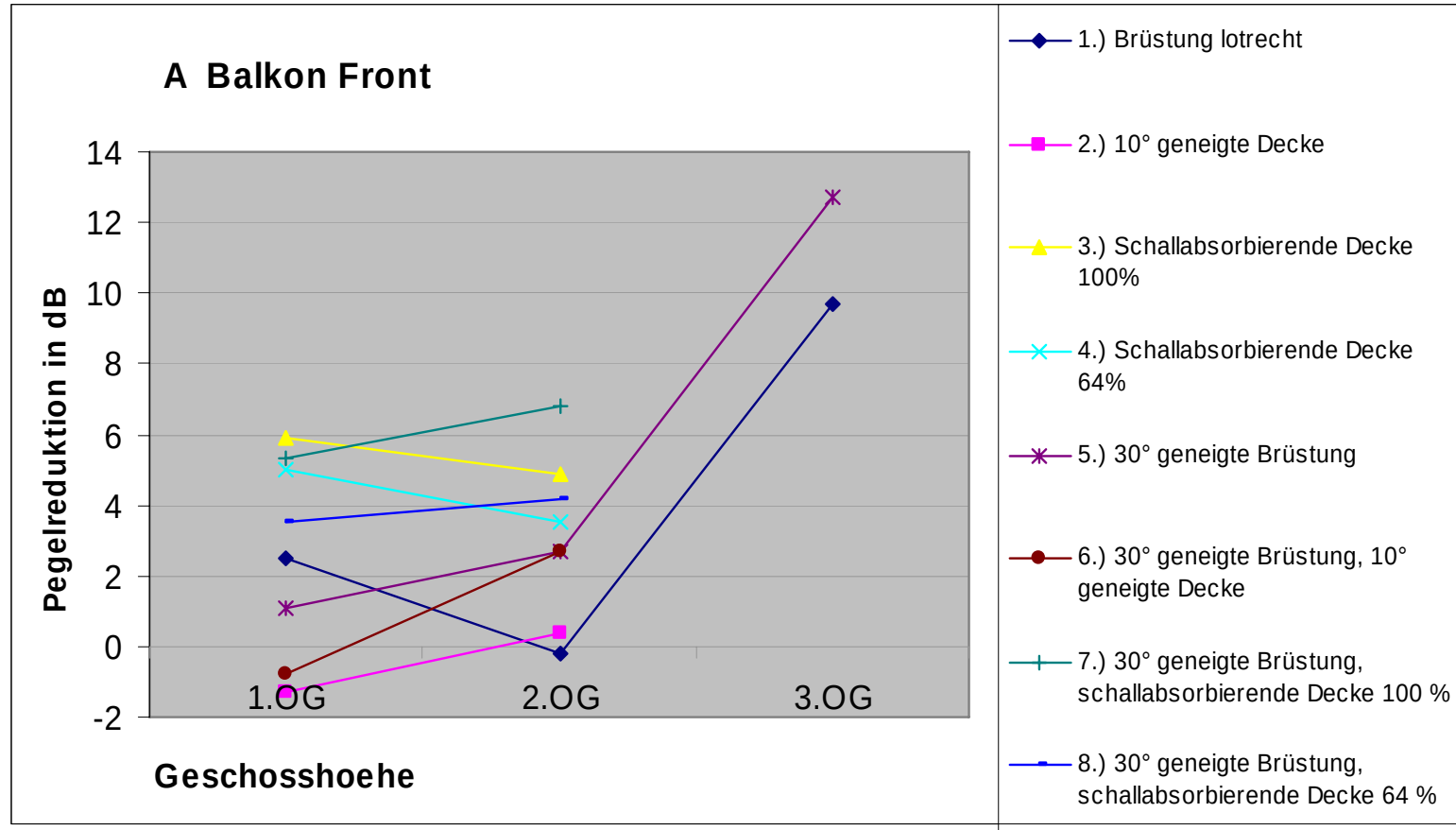
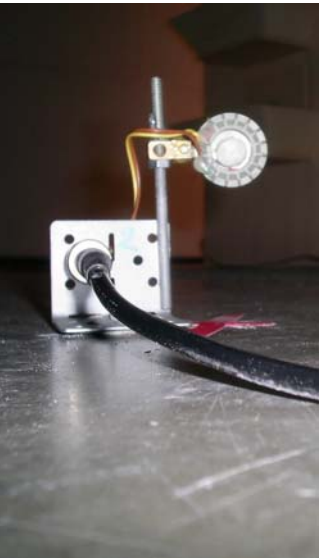
- 1/4 Zoll-Mikrofon (Type 40 BF)
- Spektrumanalysator Norsonic 840
- Mittelungszeit: 10 Sekunden
- Referenzsignal: Rosa Rauschen
- Qualitätsprüfung vor Messung

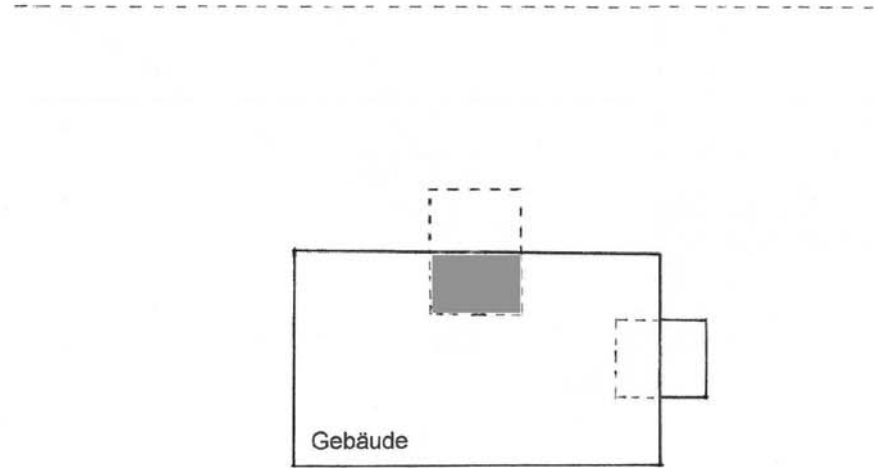
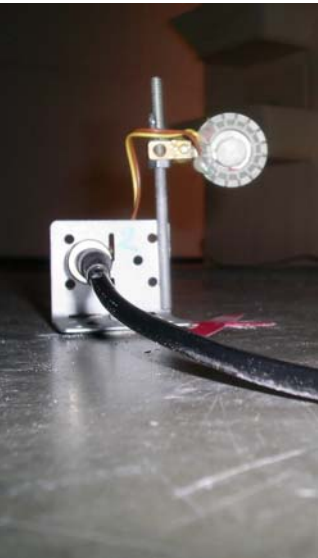
Thesen

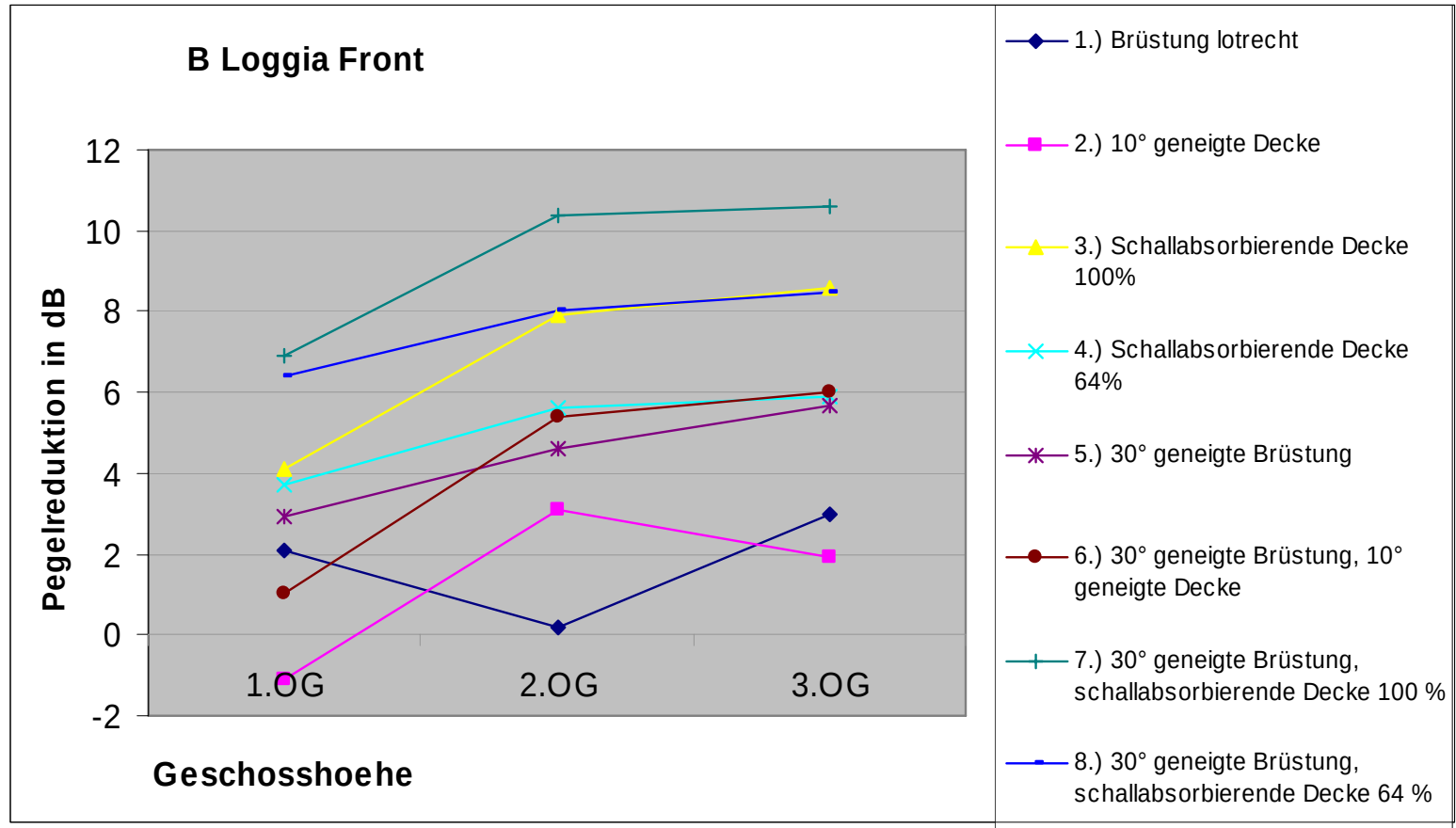
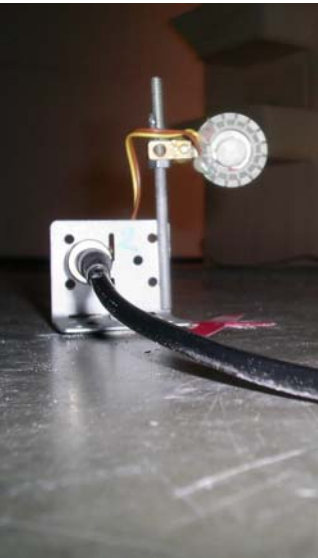


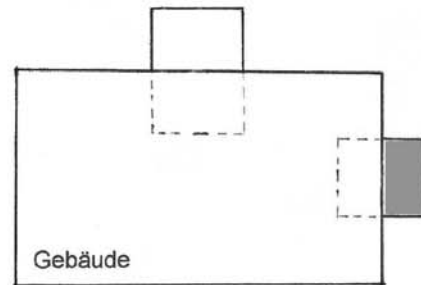
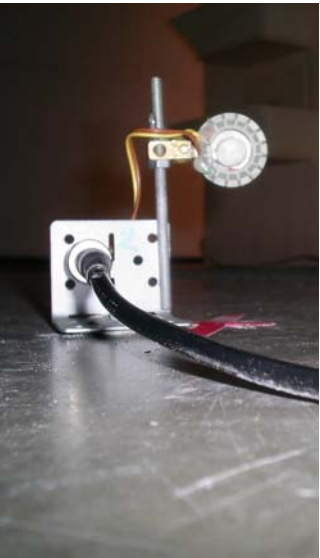
- a) Balkone erzielen höhere Pegelreduktion als Loggien
- b) zunehmende Balkon- resp. Loggiatiefe = zunehmender Abschirmeffekt
- c) zunehmende Geschosshöhe = zunehmende Pegelreduktion
- d) Ergebnisse korrelieren mit Schallpegeldifferenzen der EN 12354-3

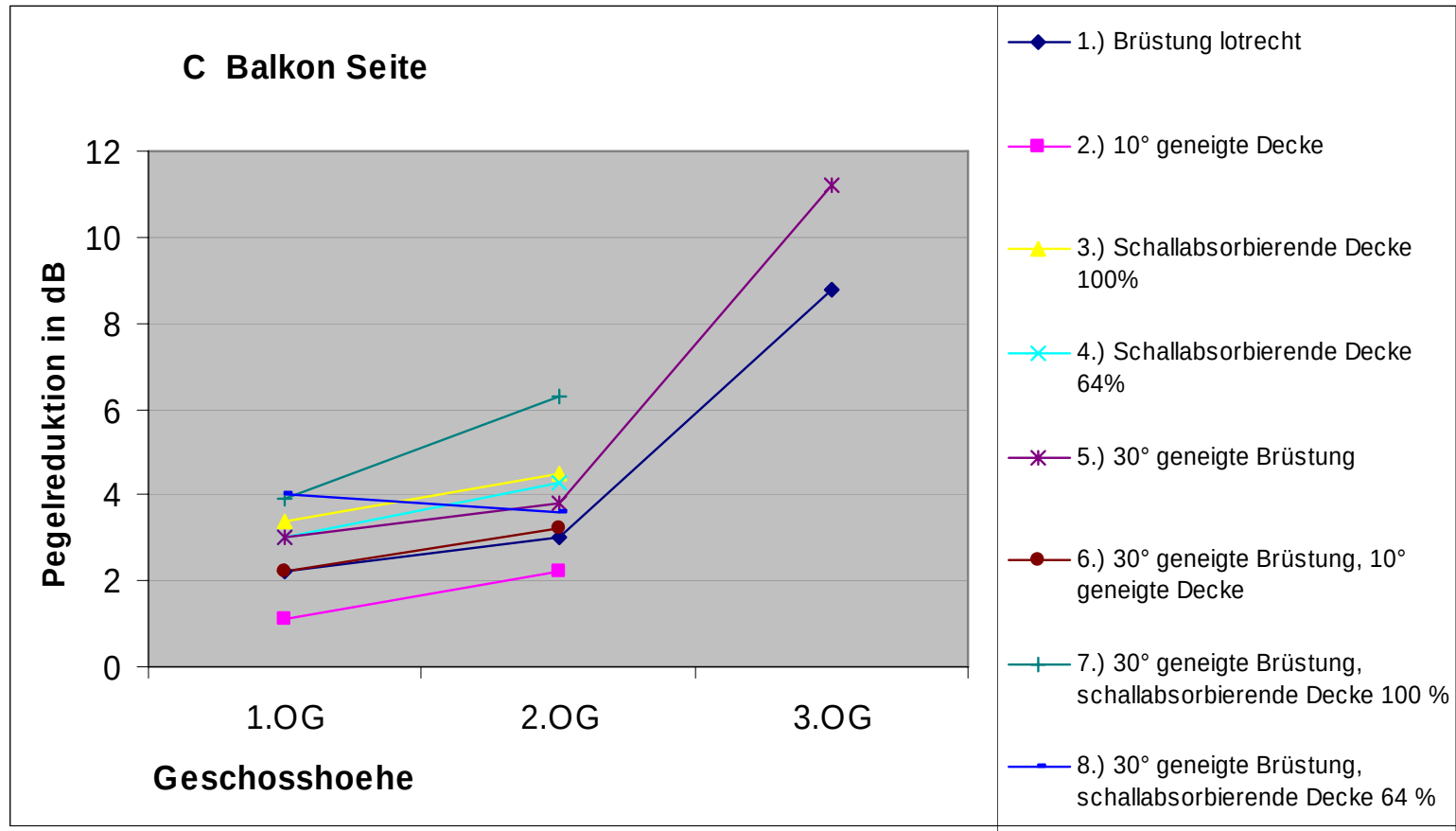
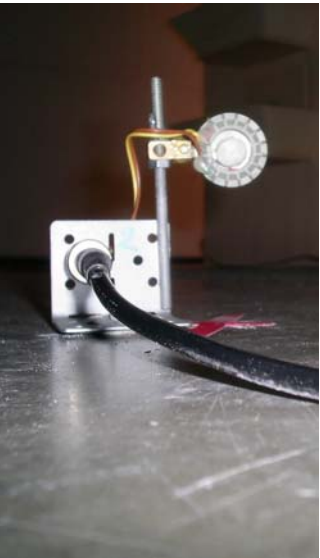


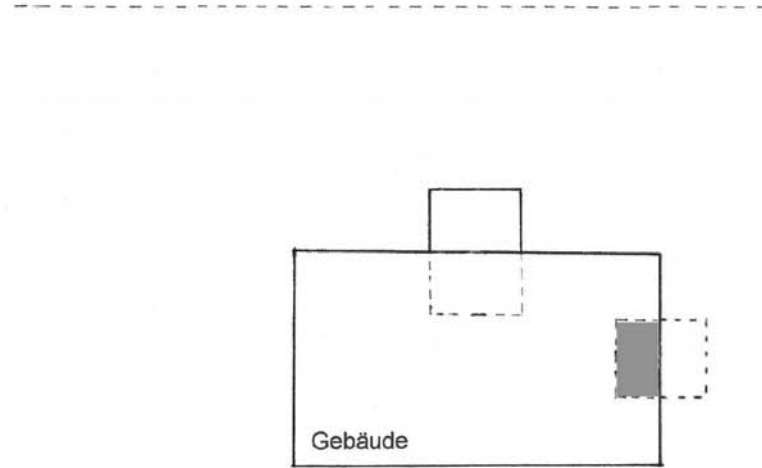
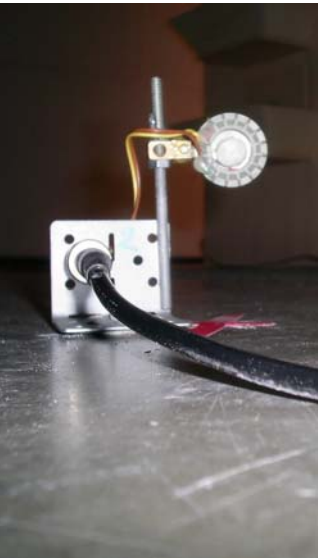


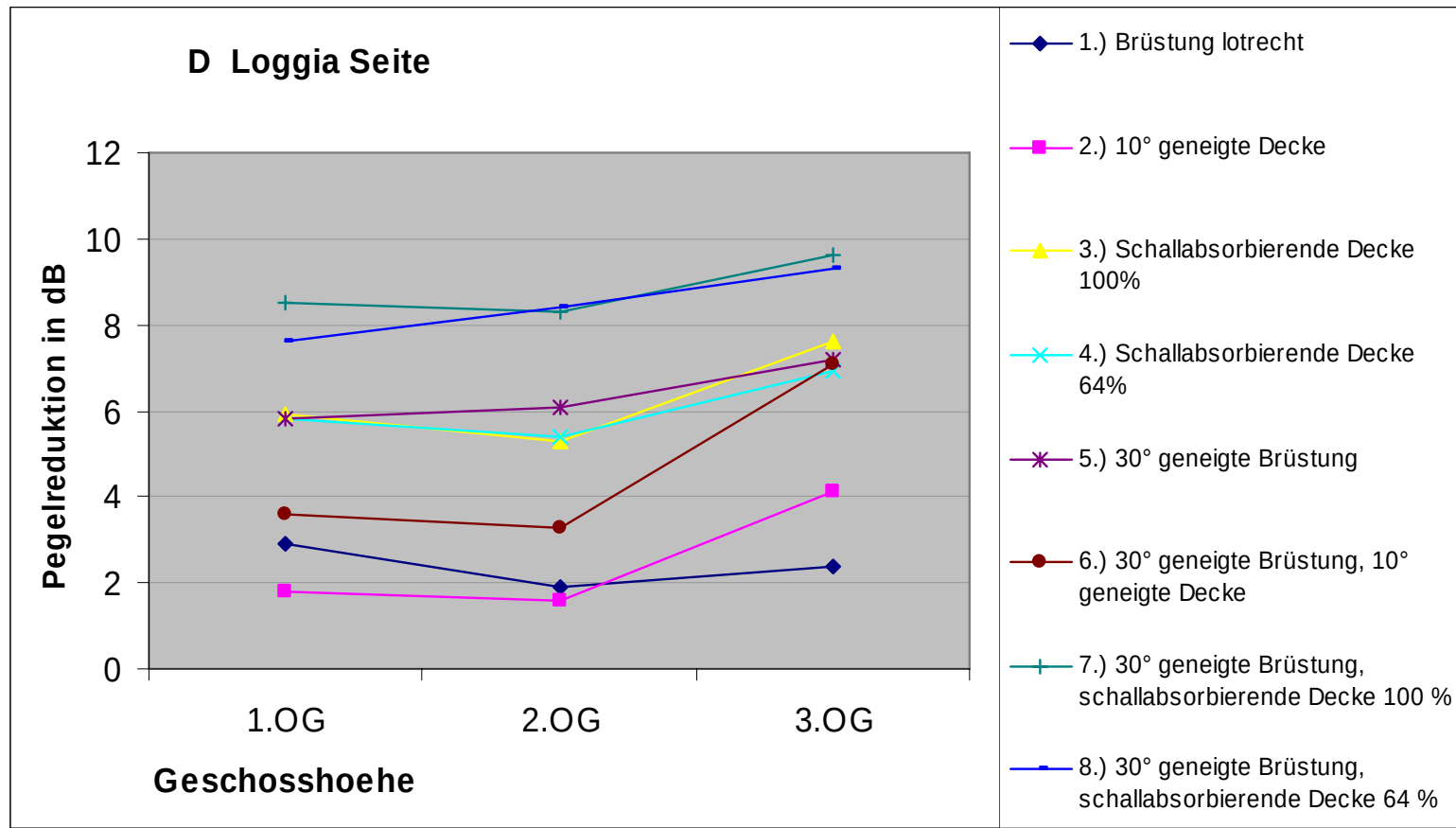
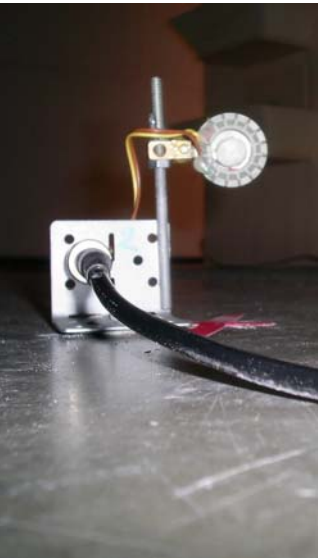


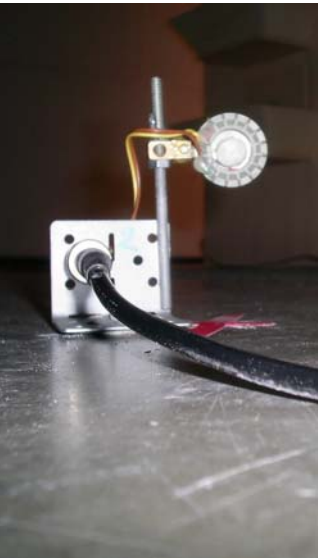




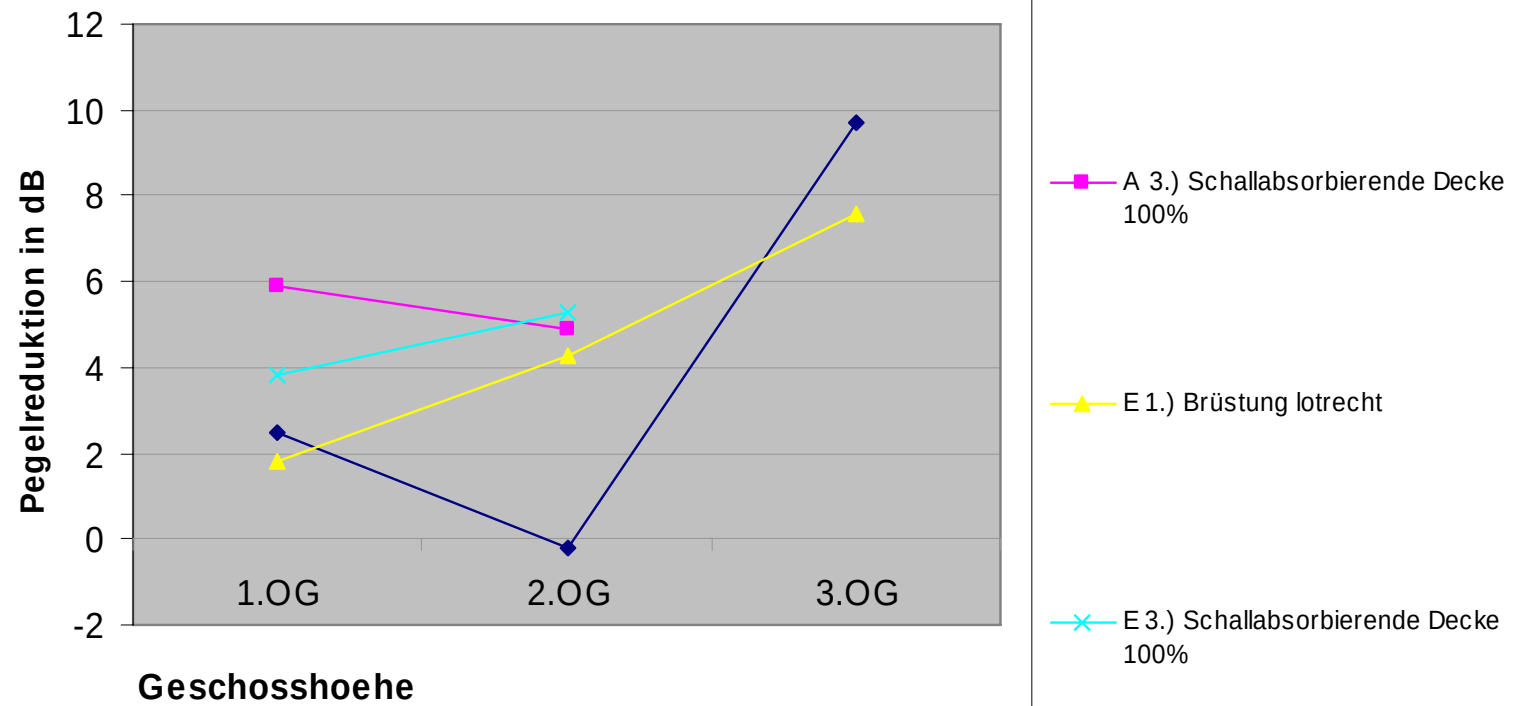


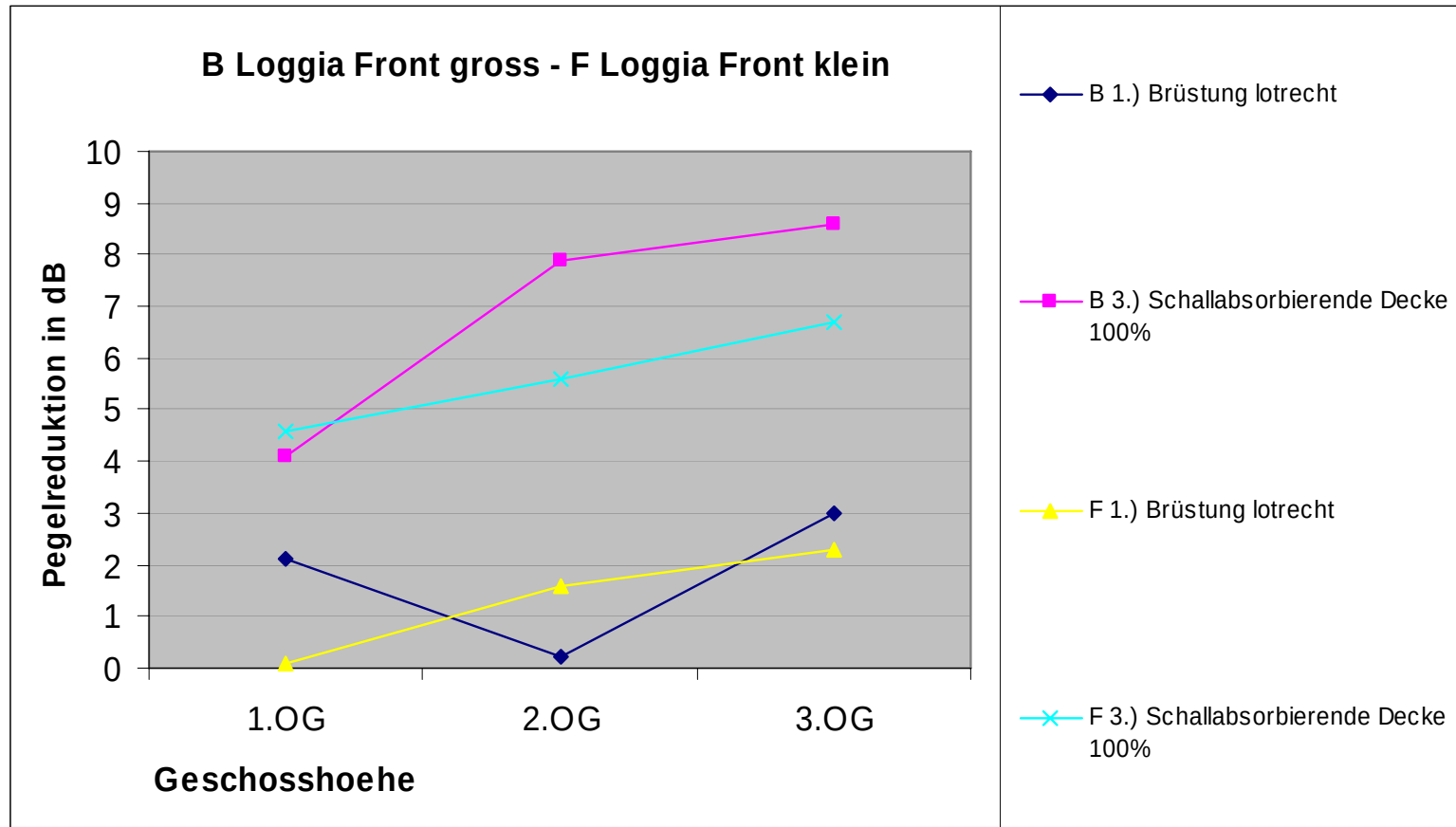
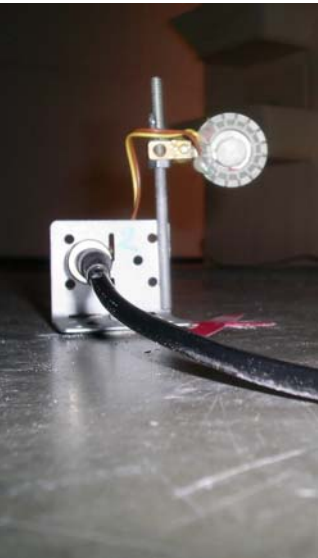




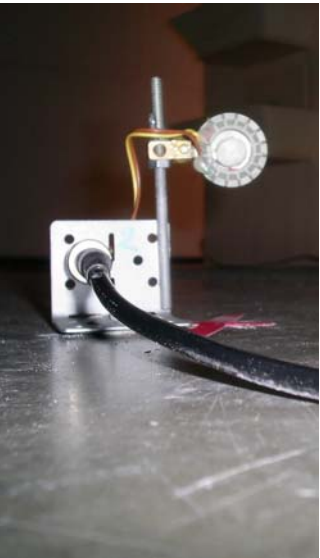


A Balkon Front gross - E Balkon Front klein



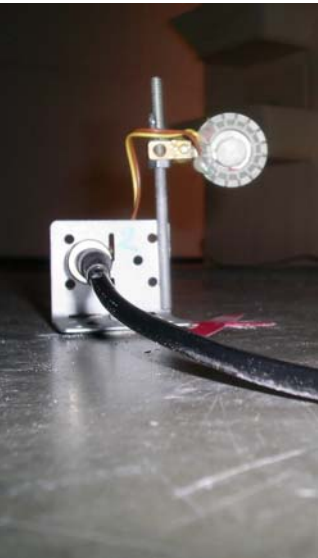


Beurteilung der Messresultate



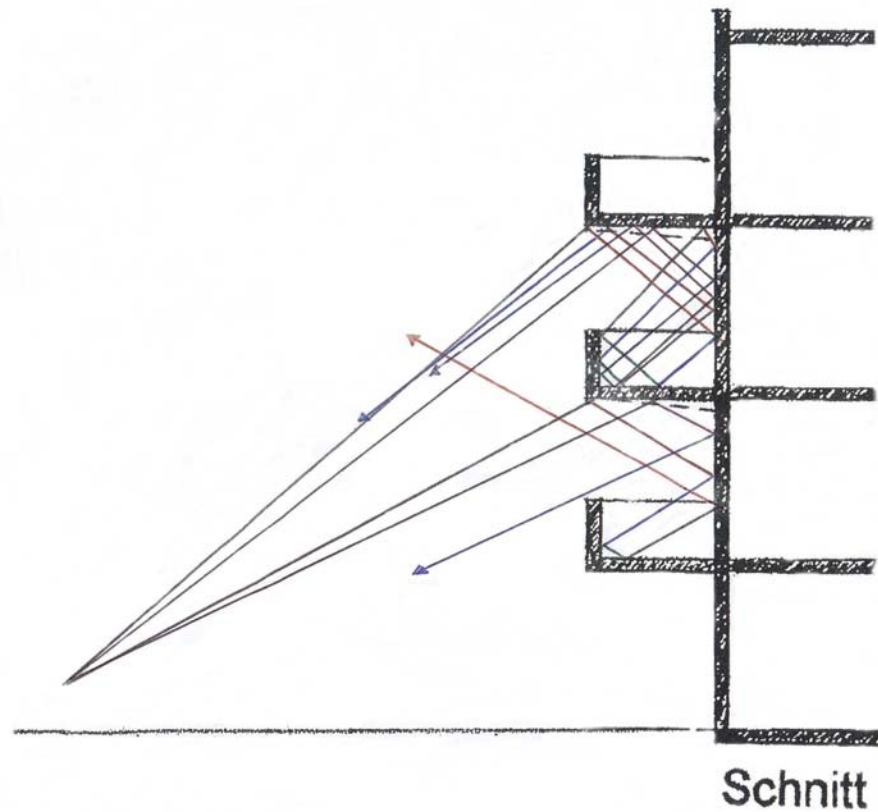
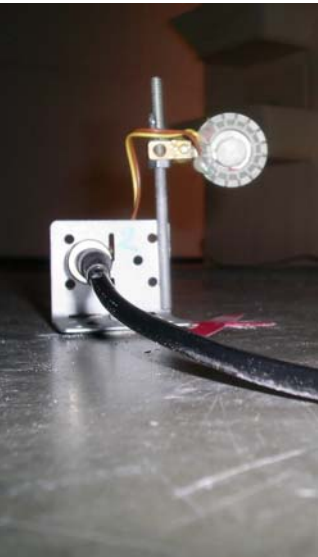
- zunehmende Geschosshöhe = höhere Pegelreduktion
- Massnahmen sind in oberen Geschossen effizienter
- zunehmende Tiefe = höhere Pegelreduktion

Beurteilung der Messresultate

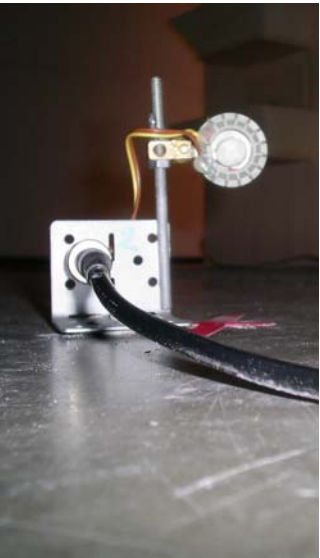


- geneigte Decken relativ wirkungslos
- geneigte Brüstungen wirkungsvoll
- schallabsorbierende Massnahmen sehr wirkungsvoll
- 2. OG: Pegelzunahme

Reflexionen an Decke bei Balkonen



Fazit



- a) Balkone erzeugen besseren Abschirmeffekt
- b) grössere Balkontiefen = höhere Pegelreduktion
- c) zunehmende Geschosshöhe = höhere Pegelreduktion
- d) Ergebnisse korrelieren mit EN 12354-3

