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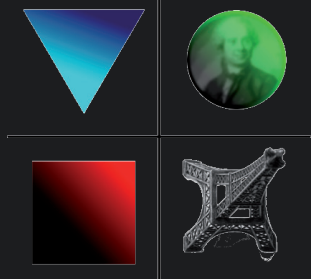
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Rebuilding of an Orchestra Rehearsal Room

Comparison between objective & perceptive measurements for room acoustic predictions



H. Dujourdy⁽¹⁾⁽²⁾ and T. Toulemonde⁽²⁾

Abstract

- › Great importance of good acoustical conditions in rehearsal room
- › No guidance of operations for design
- › This is the study of relocation of La Sirene de Paris

Summary

- › Results show good correlation between perceptual and objective measurements
- › The relation between requested acoustic characteristics and design issues leads to the modeled design with results are good compared to expected ones.
- › Guidance of acoustical design for orchestra rehearsal room has been developed from literature and our own experience

Measurement Study in Other Rooms

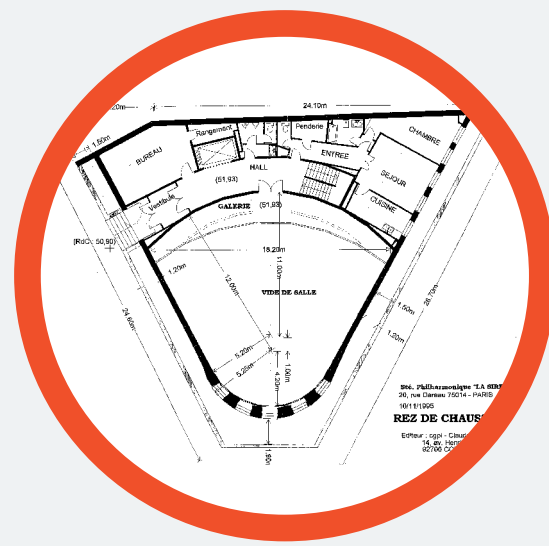


Figure 1: Ground plan of La Sirène



Figure 2: Equipment in La Sirène

| Freq.(Hz) | EDT(s) | TR30(s) | C80(dB) | D50(%) | ST1(dB) | Tc(ms) |
|-----------|--------|---------|---------|--------|---------|--------|
| 125 | 0.9 | 1.2 | 4.8 | 56.5 | -2.9 | 62.3 |
| 250 | 0.7 | 1.0 | 6.5 | 63.9 | -3.8 | 47.6 |
| 500 | 0.8 | 0.9 | 6.2 | 62.9 | -3.8 | 49.4 |
| 1000 | 0.9 | 0.9 | 5.0 | 59.0 | -3.0 | 56.0 |
| 2000 | 0.8 | 1.0 | 5.9 | 63.9 | -7.8 | 49.3 |
| 4000 | 0.7 | 1.0 | 6.9 | 69.7 | -4.3 | 41.8 |

Figure 3: Acoustical indices in La Sirène (empty)
Volume: 1200 m³
Gauge: 100 persons

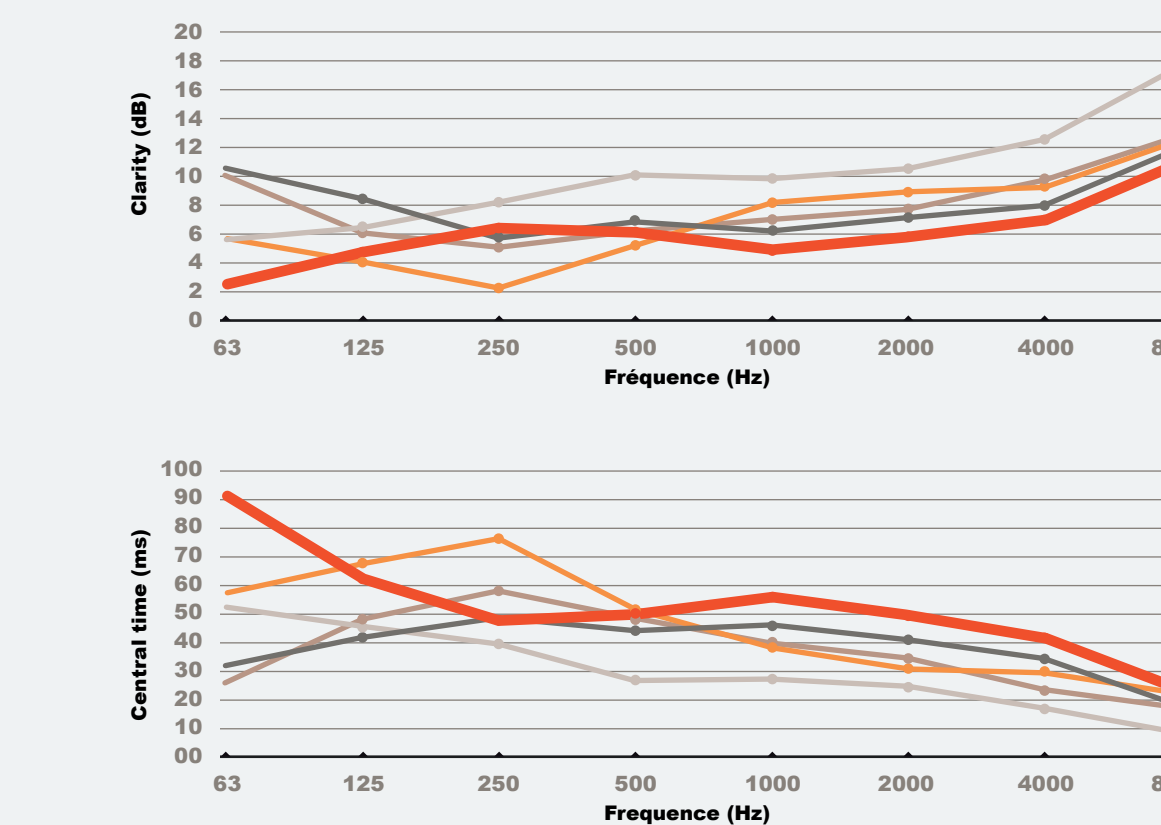
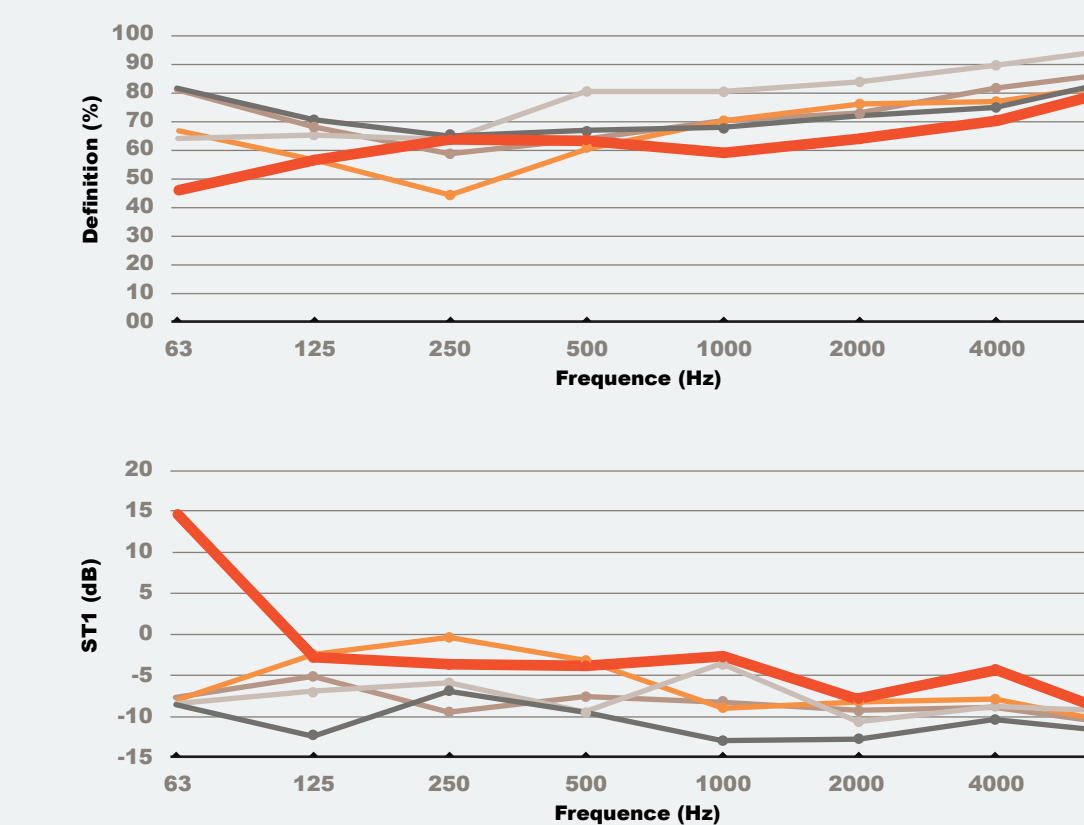
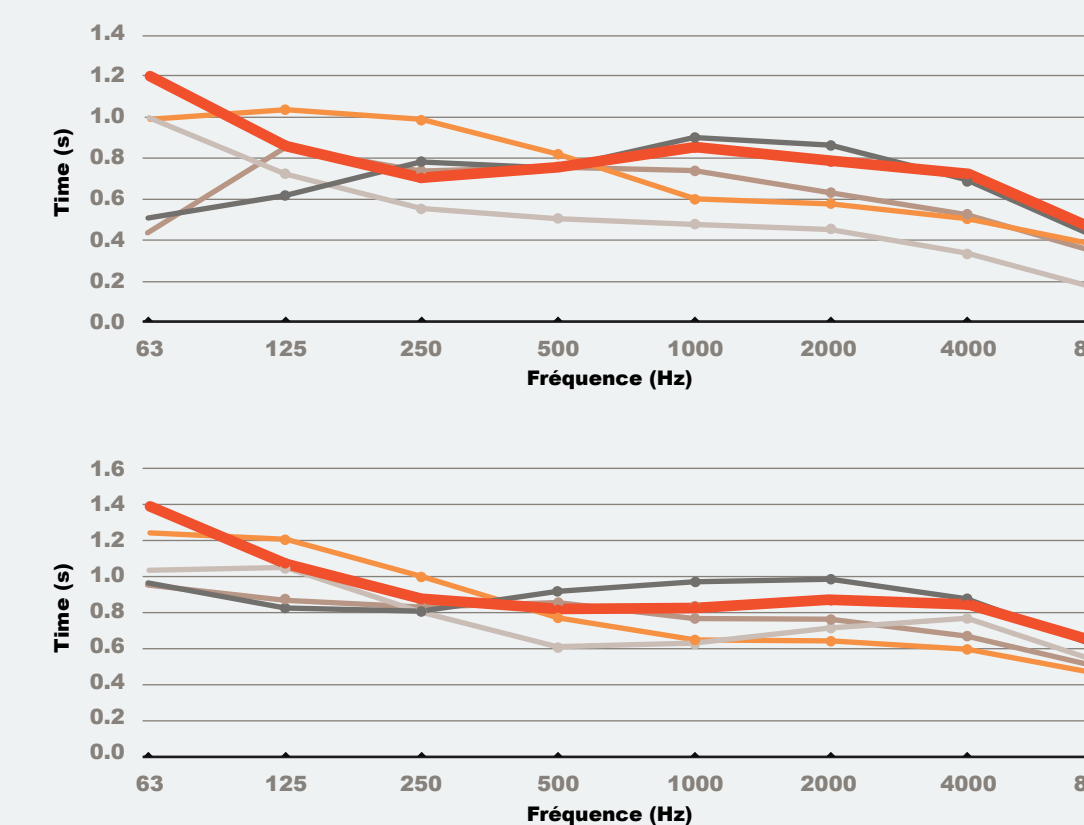


Figure 4: Measurement results

- Bondy
- CMA17
- Levallois
- RATP
- La Sirène

Perceptual study in La Sirène

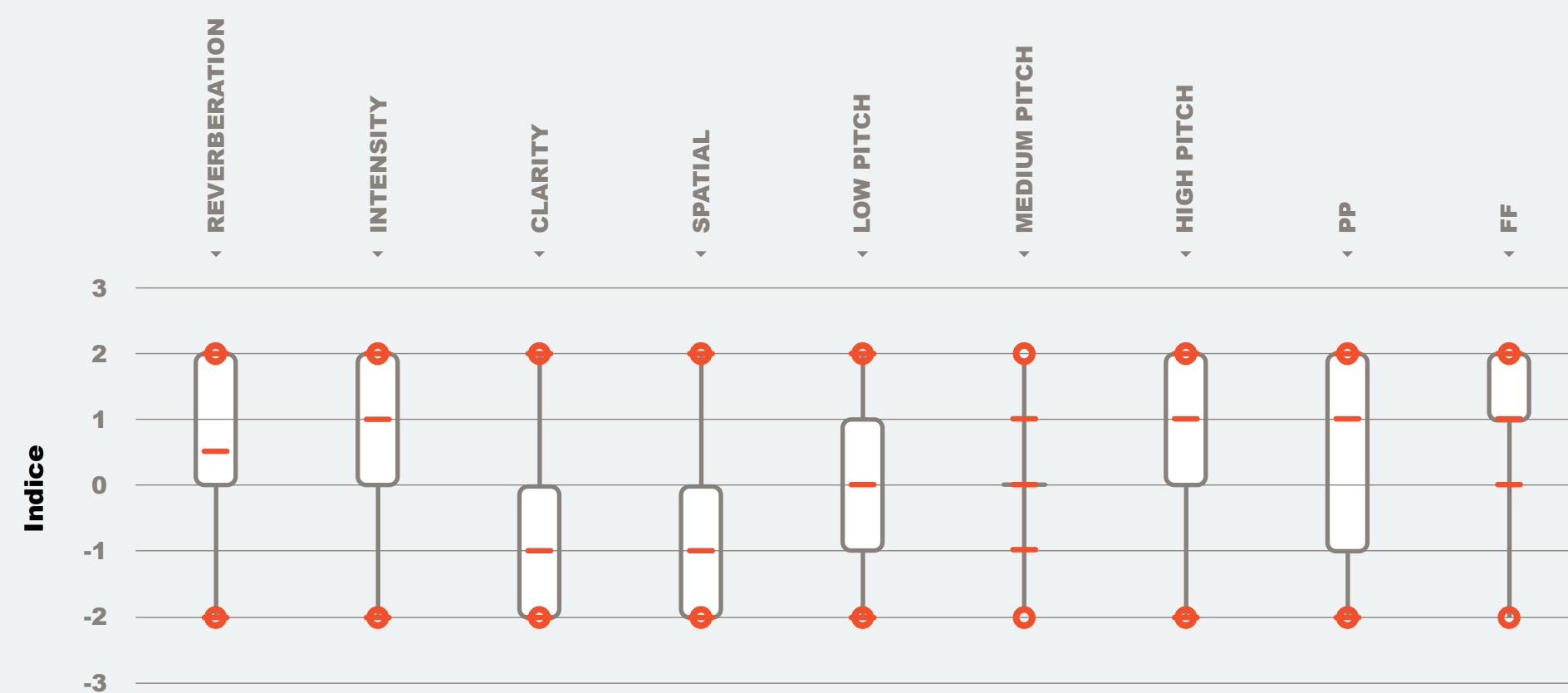


Figure 5: Perceptive results

Toward Acoustic Solution

Modelling of the Room with CATT-Acoustic



Figure 6: Lateral view

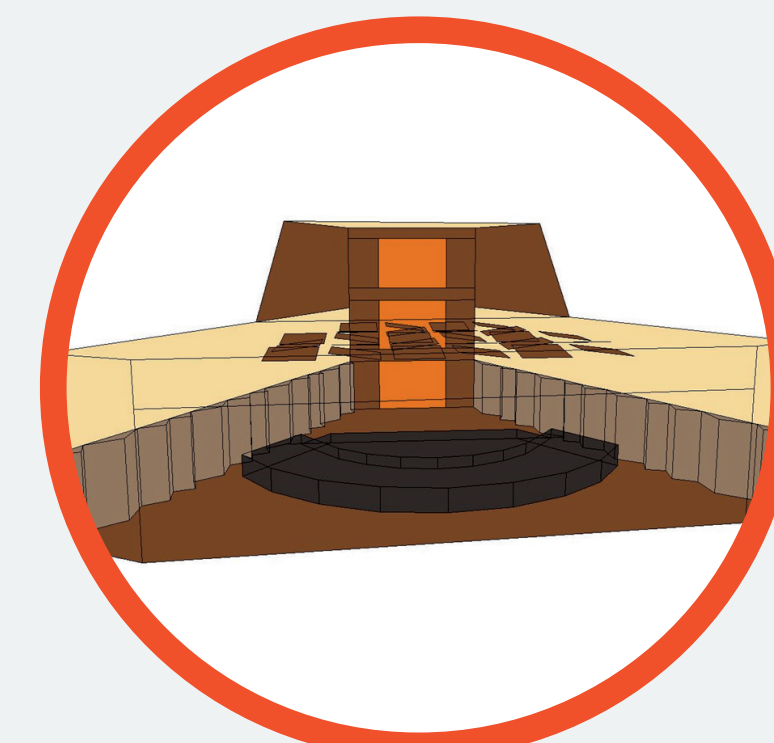


Figure 7: Front view

New Room Acoustic Furnitures

- 1 Ceiling : reflecting square panels of 2 meters wide
- 2 Ceiling : absorbing wool fiber
- 3 Broadband absorption perforate wood
- 4 Diffusing items and low frequency absorbers
- 5 Bleachers for musicians

(1) LAM d'Alembert, UPMC, Paris, France

(2) IMPEDANCE SAS, Paris, France

