

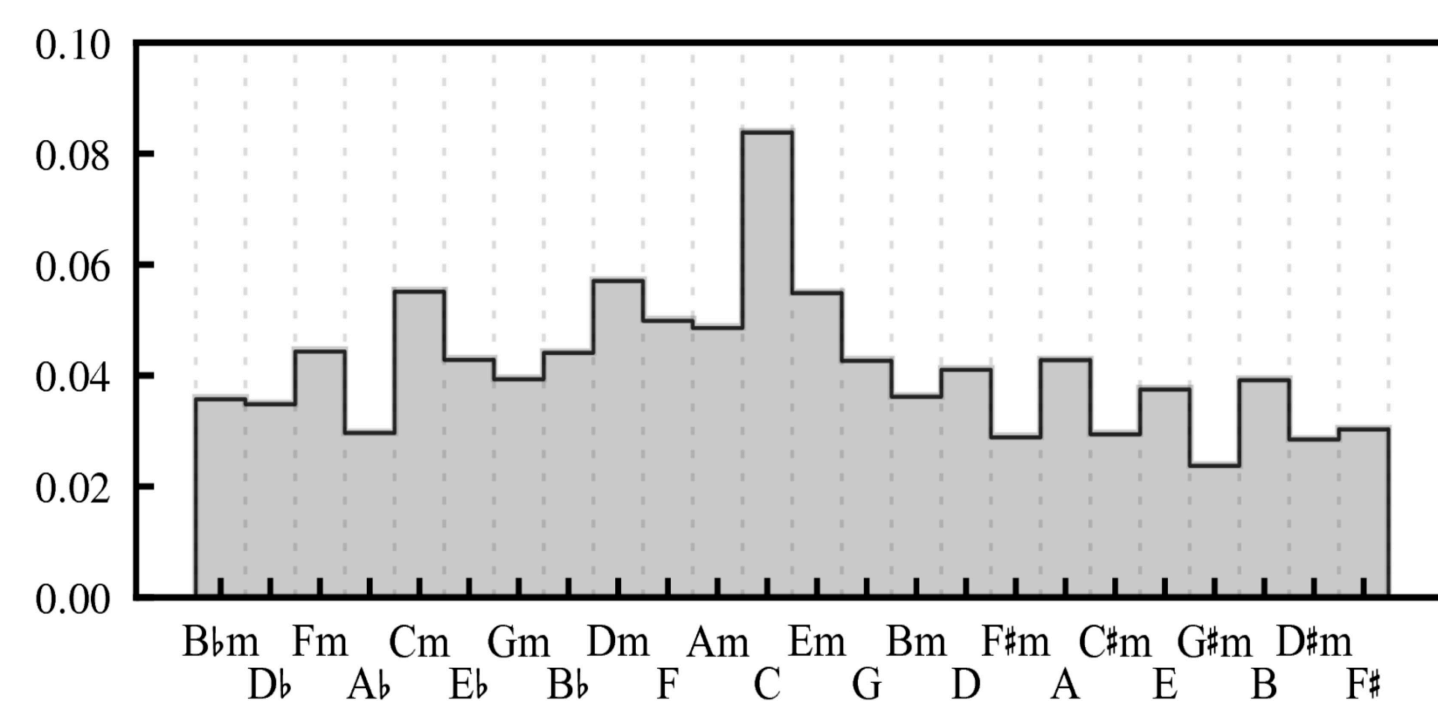
# Exploring Tonal-Dramatic Relationships in Richard Wagner's Ring Cycle

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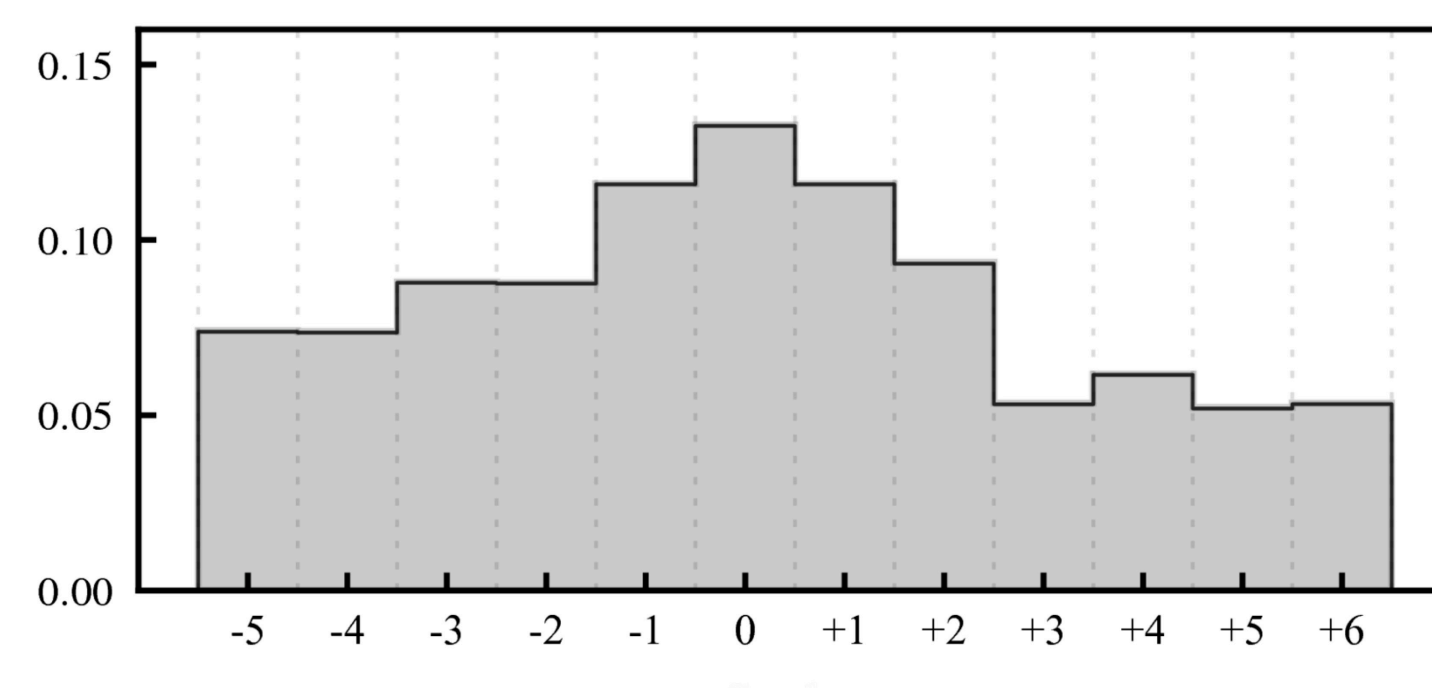
## Abstract

Richard Wagner's cycle *Der Ring des Nibelungen*, consisting of four music dramas, constitutes a comprehensive work of high importance for Western music history. In this work, we indicate how MIR methods can be applied to explore this large-scale work with respect to tonal properties. Our investigations are based on a data set that contains 16 audio recordings of the entire *Ring* as well as extensive annotations including measure positions, singer activities, and leitmotif regions. As a basis for the tonal analysis, we make use of common audio features, which capture local chord and scale information. Employing a cross-version approach, we show that global histogram representations can reflect certain tonal relationships in a robust way. Based on our annotations, a musicologist may easily select and compare passages associated with dramatic aspects, for example, the appearance of specific characters or the presence of particular leitmotifs. Highlighting and investigating such passages may provide insights into the role of tonality for the dramatic conception of Wagner's *Ring*. By giving various concrete examples, we indicate how our approach may open up new ways for exploring large musical corpora in an intuitive and interactive way.

## The Full Ring Cycle

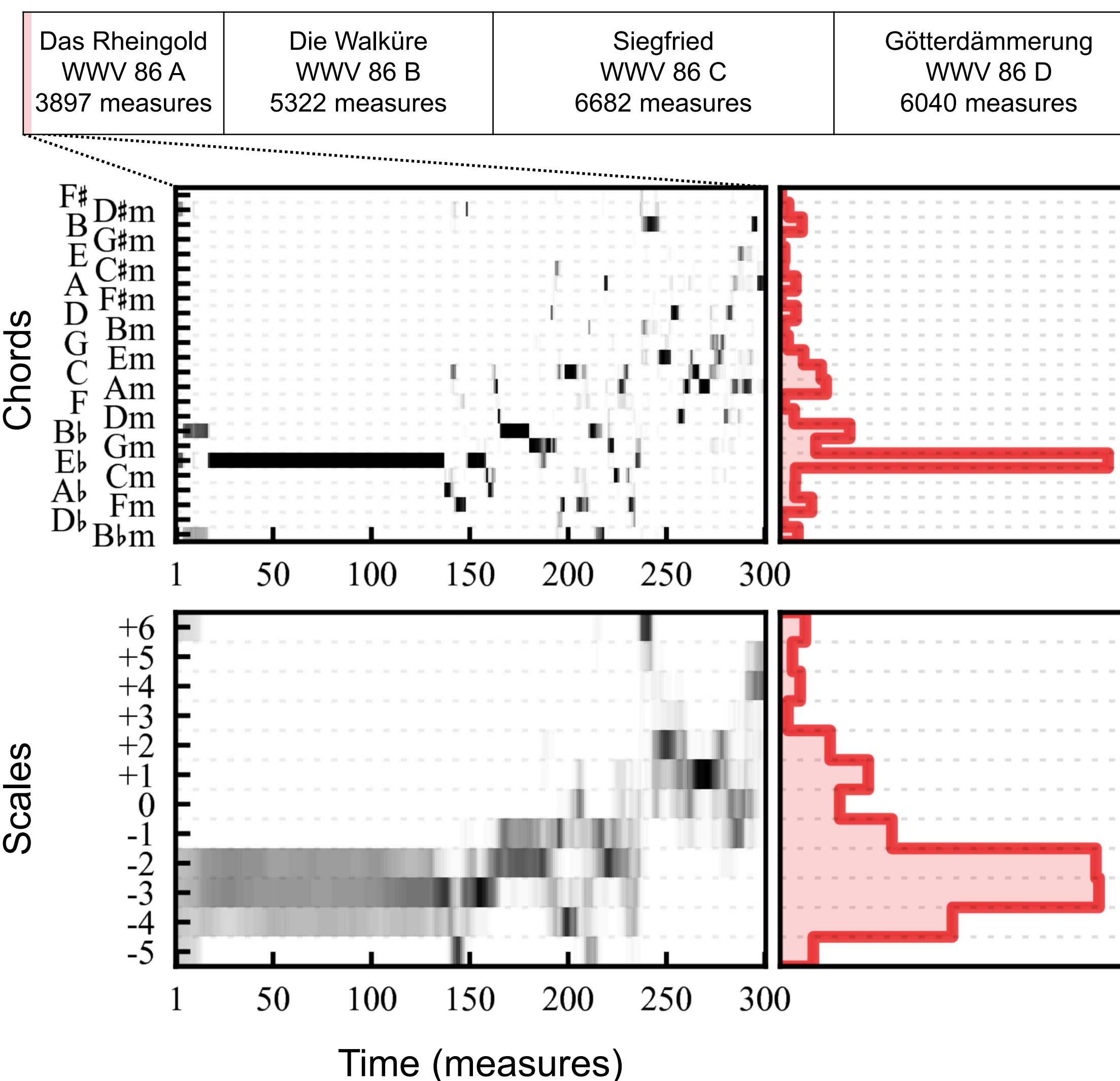


Chords



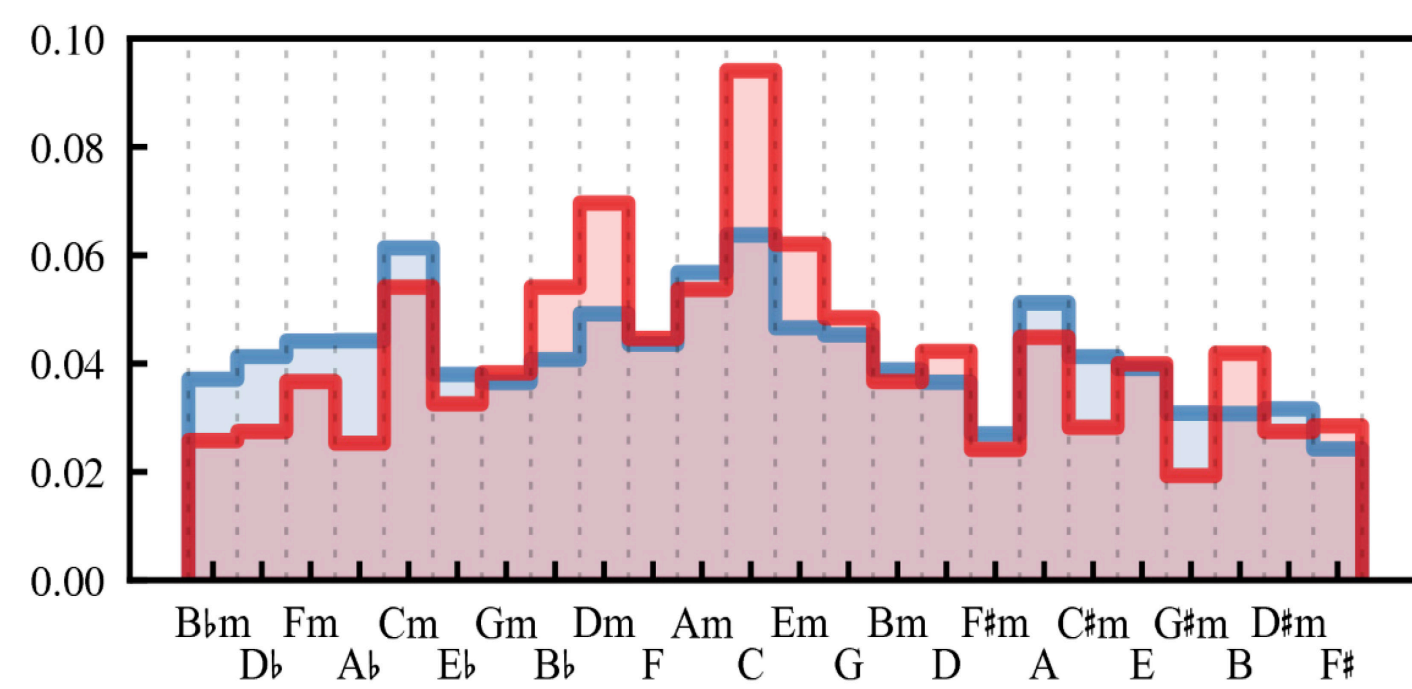
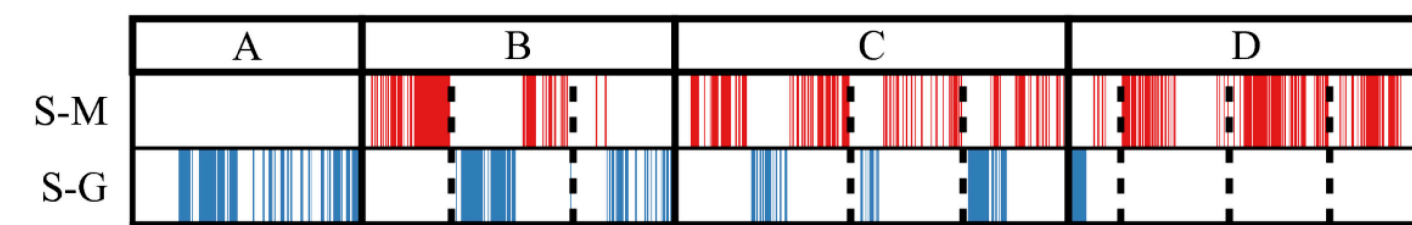
Scales

## Histograms Presenting Tonal Information

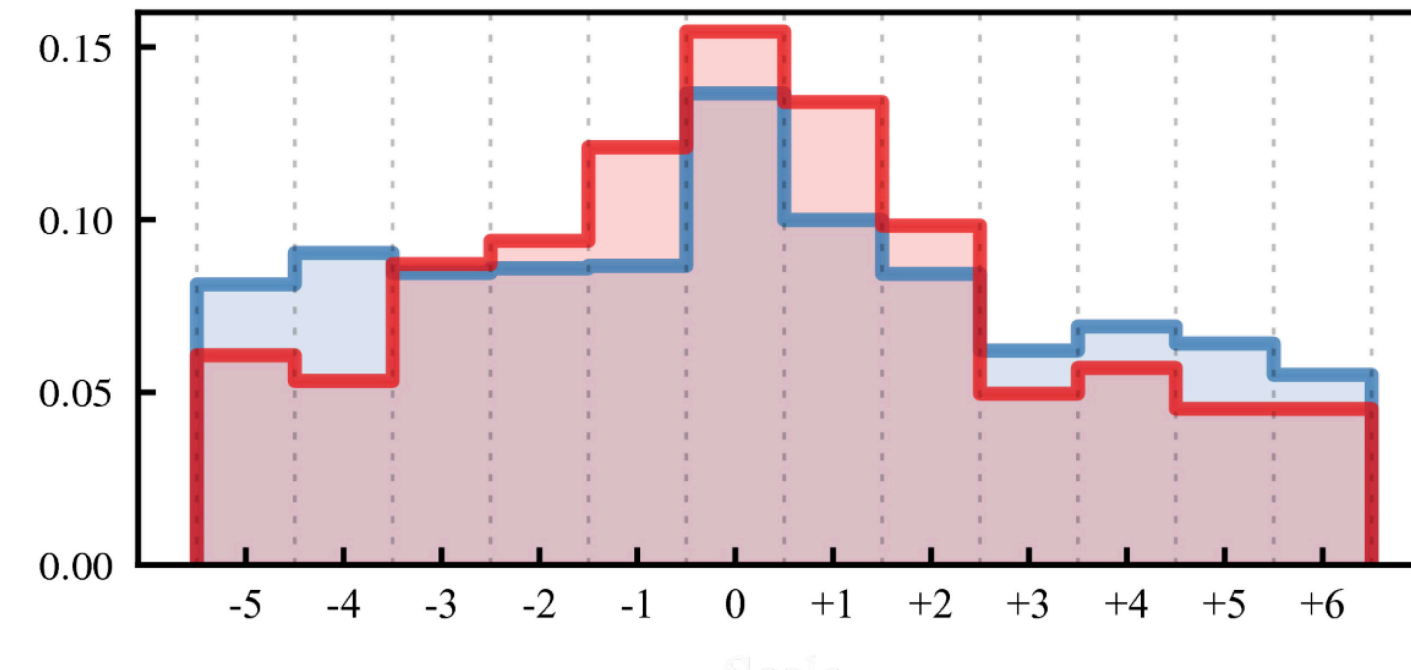


- Tonal analysis based on **chroma features**
- 24 **chords** [2]: Major triads (C, G, ...) and minor triads (Cm, Gm, ...)
- 12 **diatonic scales** [5]: Correspond to key signature (+2 = 2#)
- Ordered according to **circle of fifths**
- **Histogram** representation by averaging over (musical) time

## Comparison of Mortals and Gods Singing



Chords



Scales

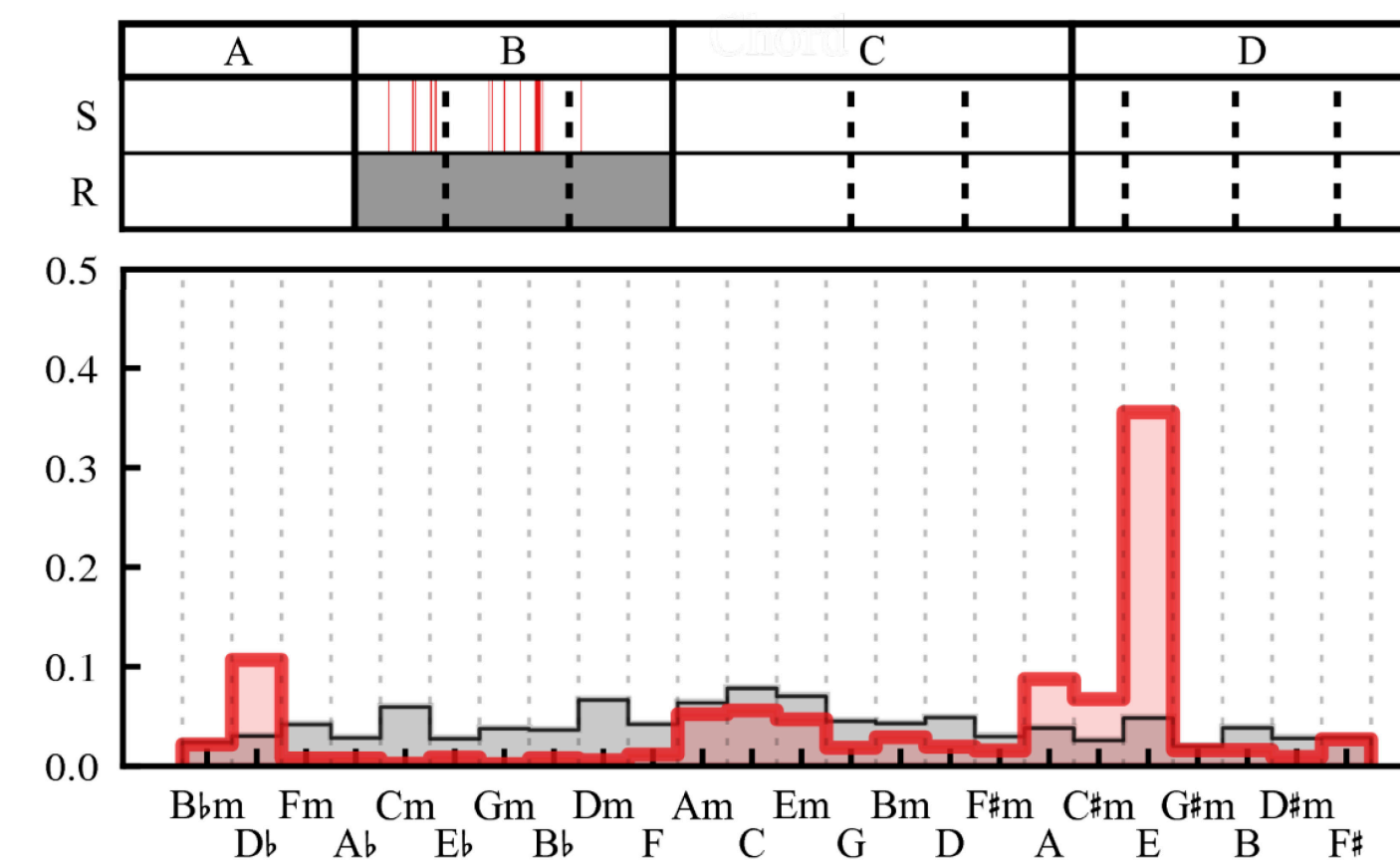
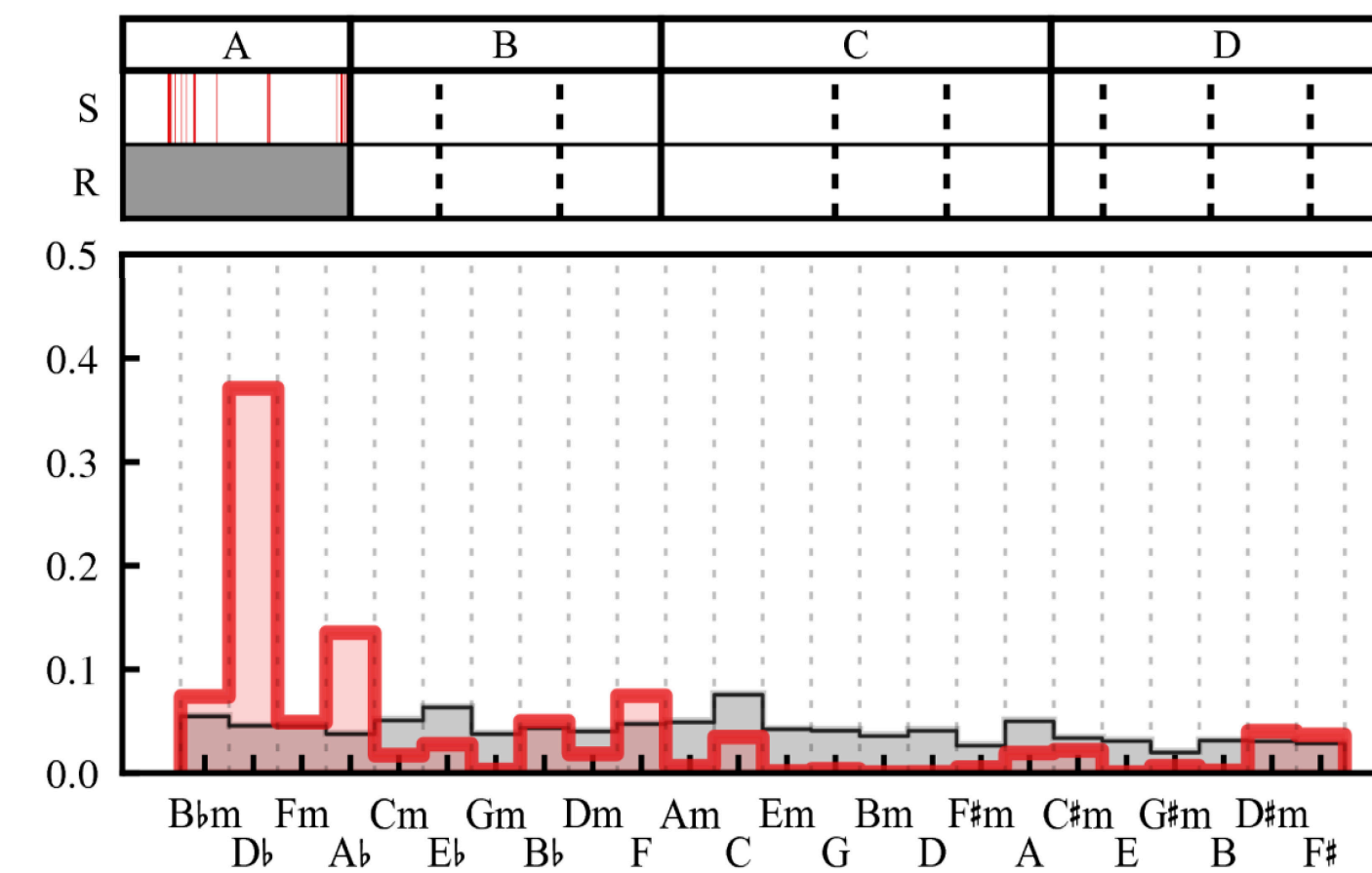
## Data Set

No.	Conductor	Recording	hh:mm:ss
1	Barenboim	1991–92	14:54:55
2	Boulez	1980–81	13:44:38
3	Böhm	1967–71	13:39:28
4	Furtwängler	1953	15:04:22
5	Haitink	1988–91	14:27:10
6	Janowski	1980–83	14:08:34
7	Karajan	1967–70	14:58:08
8	Keilberth/Furtwängler	1952–54	14:19:56
9	Krauss	1953	14:12:27
10	Levine	1987–89	15:21:52
11	Neuhold	1993–95	14:04:35
12	Sawallisch	1989	14:06:50
13	Solti	1958–65	14:36:58
14	Swarowsky	1968	14:56:34
15	Thielemann	2011	14:31:13
16	Weigle	2010–12	14:48:46

- **Measure-wise analysis** of all 16 performances [4, 6]
- Annotations for **singing voice regions** and **leitmotifs**

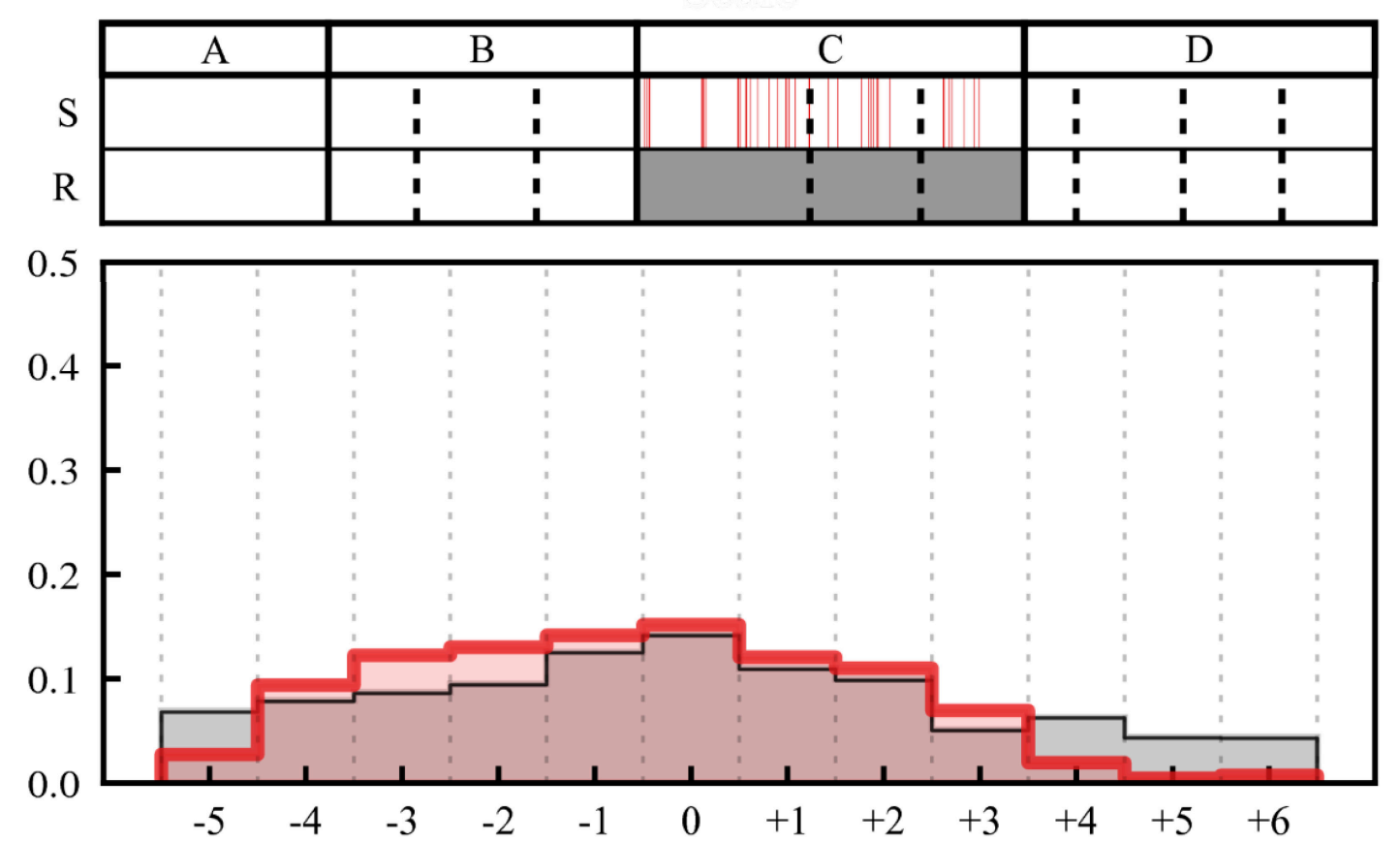
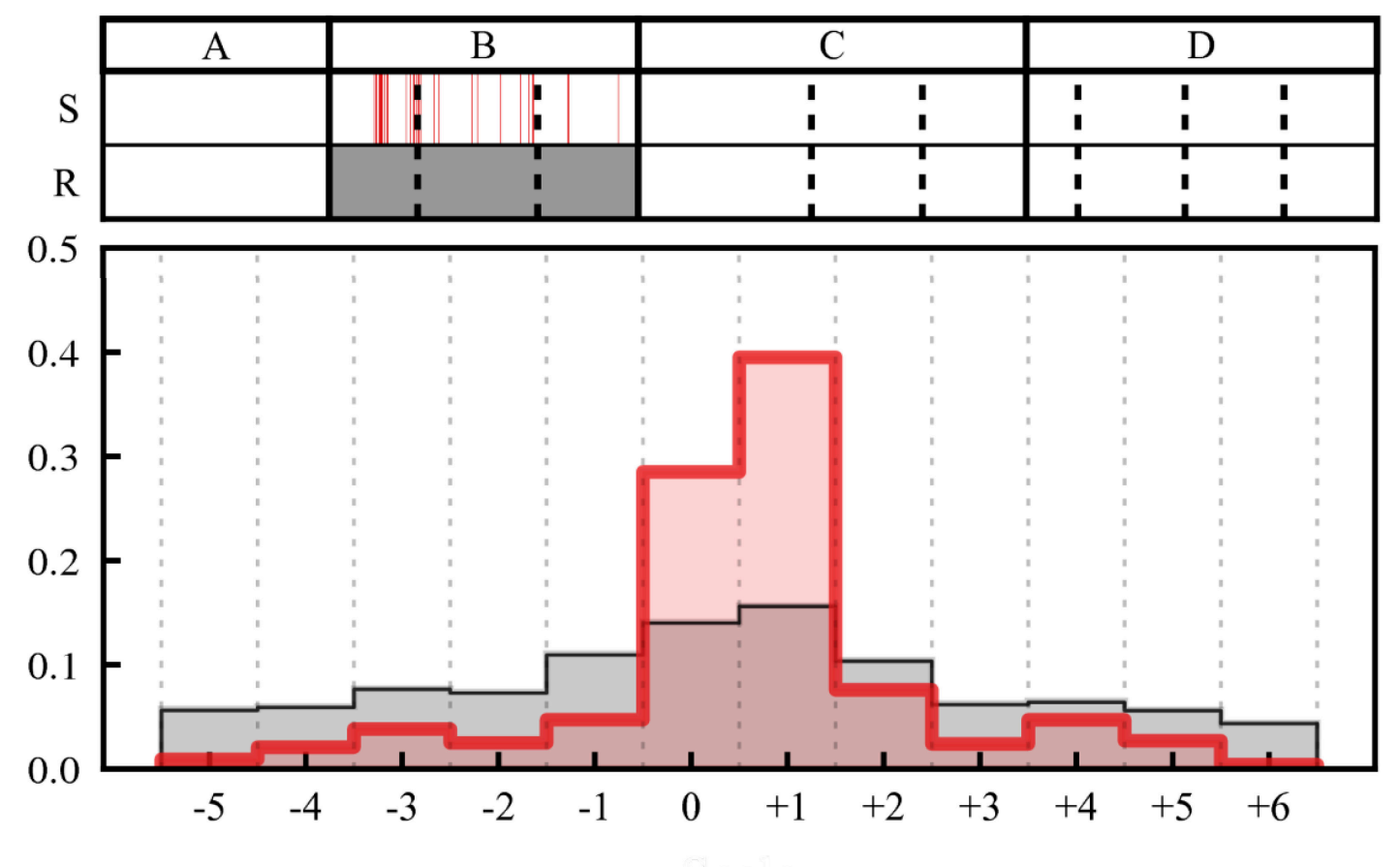
## Leitmotifs

### Valhalla motif



Chords

### Sword motif



Scales

## References & Acknowledgments

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- [6] F. Zalkow, C. Weiß, T. Prätzlich, V. Arifi-Müller, and M. Müller. *A multi-version approach for transferring measure annotations between music recordings*. In Proc. of the AES Int. Conf. on Semantic Audio, Erlangen, Germany, 2017.

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