

Supplementary Materials: Structures in Sound: Analysis of Classical Music Using the Information Length

Schuyler Nicholson and Eun-jin Kim

1. Sample PDFs

Figure S1 shows a sample PDF (probability distribution functions) from Tchaikovsky's 1812 Overture. We see that the PDFs are very intermittent and not belonging to any class of smooth PDFs.

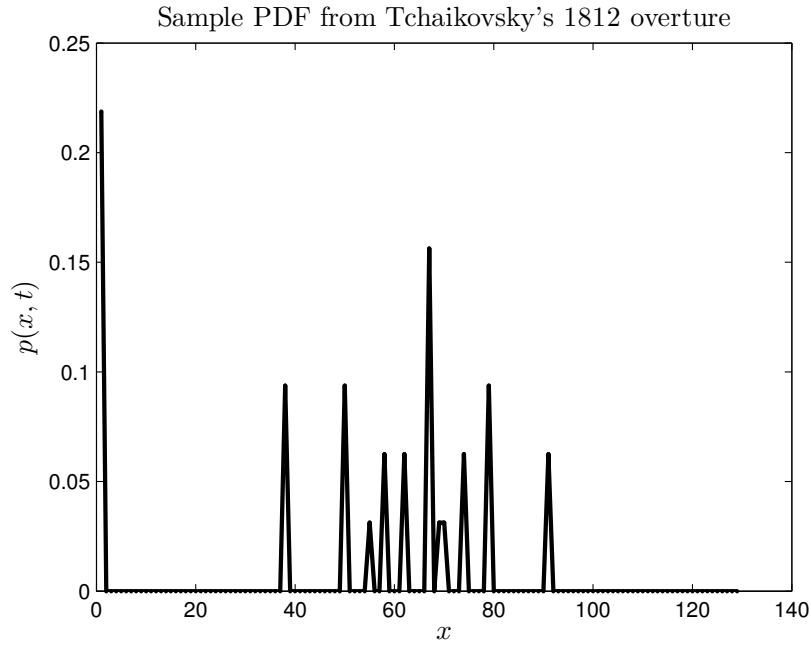


Figure S1. A sample PDF from Tchaikovsky's 1812 Overture.

2. Supplementary Figures

Here we show the log-log plots for \mathcal{L} and \mathcal{J} for each composition (Figure S2), not shown in the main body of the text. All compositions examined also follow approximate power laws.

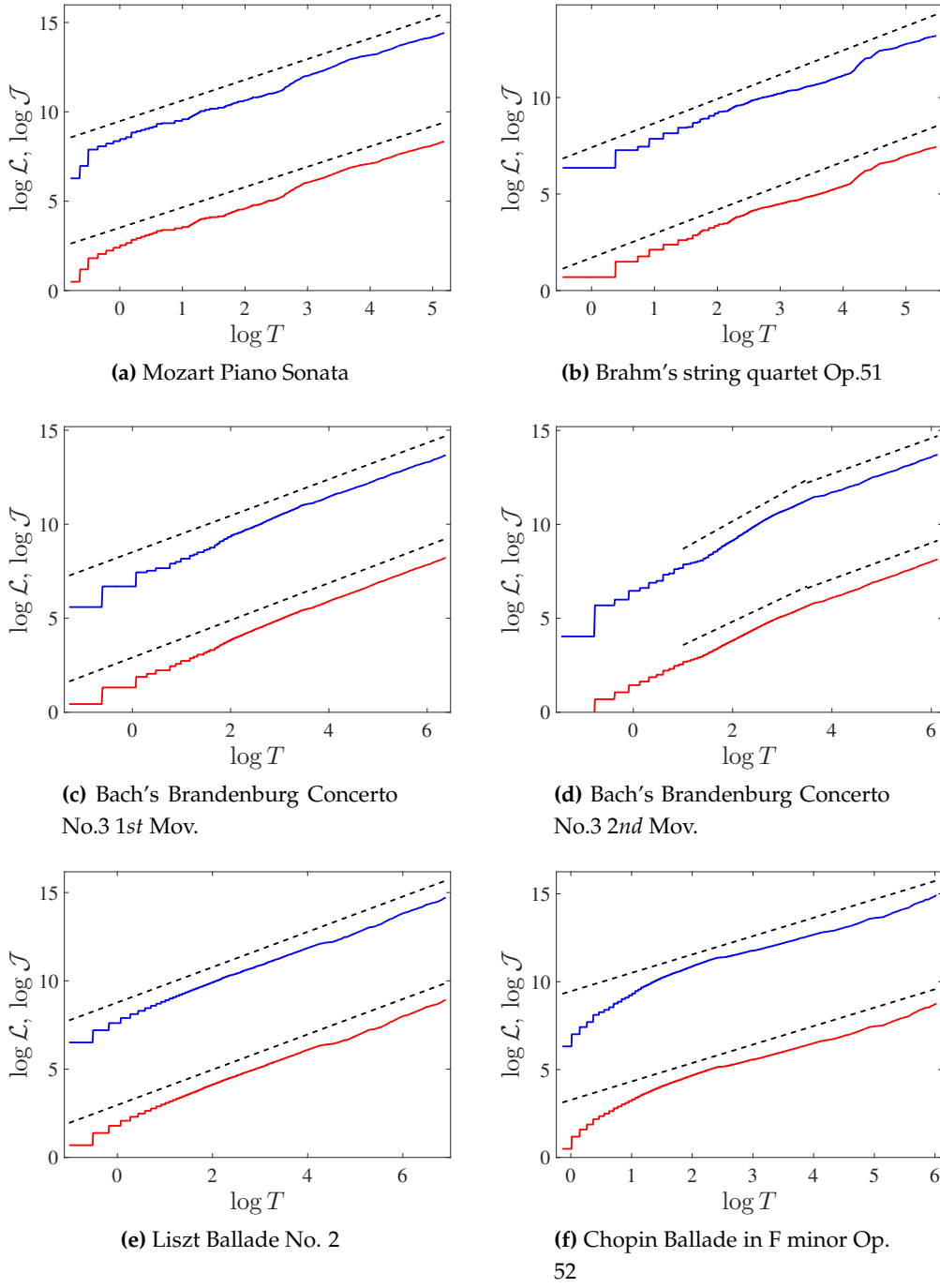
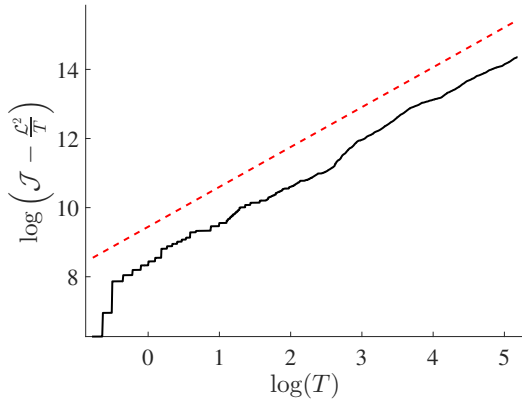
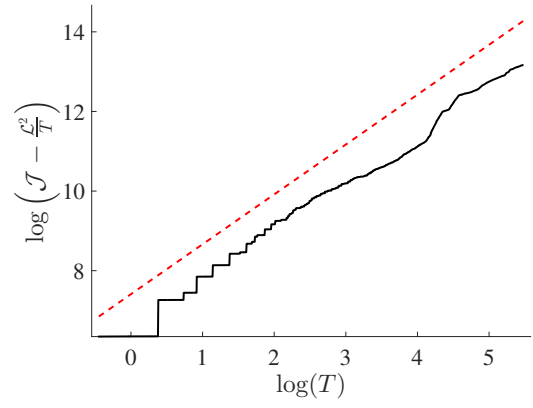


Figure S2. log-log plots for \mathcal{L} and \mathcal{J} .

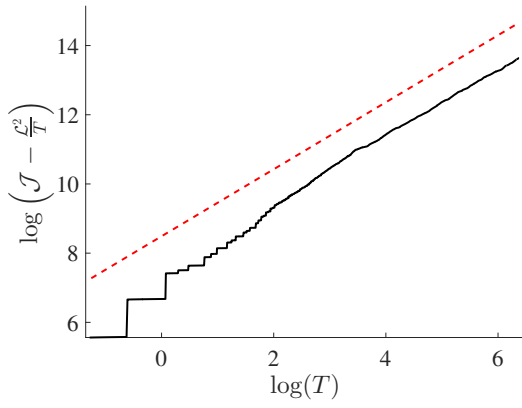
log-log plot for $\mathcal{J} - \mathcal{L}^2/T$ for each composition not featured in the main text. Each composition deviates from the minimum path, except for Liszt's Ballade No.2 which has a slope, very near one. Liszt's Ballade also has periodic forcing, as shown in Figure S5e. Meaning a linear slope does not guarantee periodic forcing.



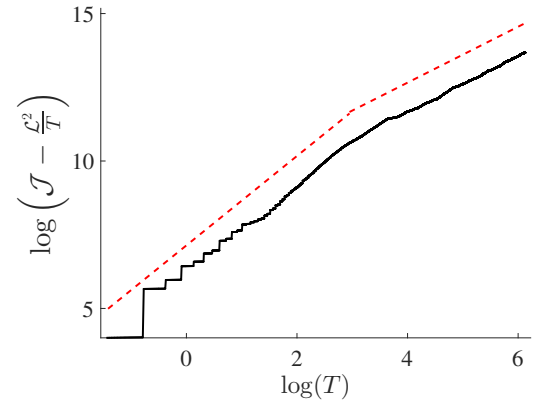
(a) Mozart Piano Sonata



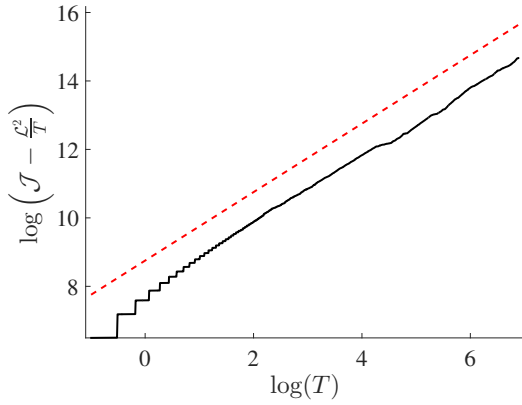
(b) Brahms's string quartet Op. 51



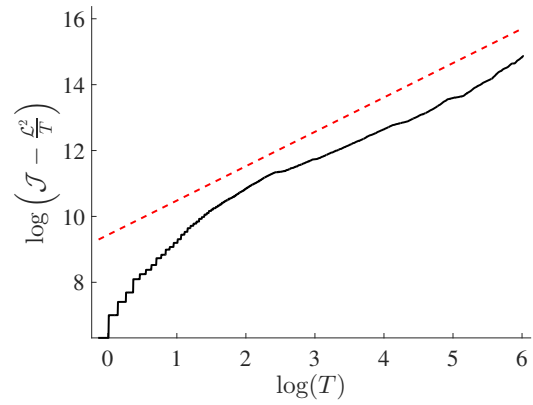
(c) Bach's Brandenburg Concerto No.3
1st Mov.



(d) Bach's Brandenburg Concerto No.3
2nd Mov.



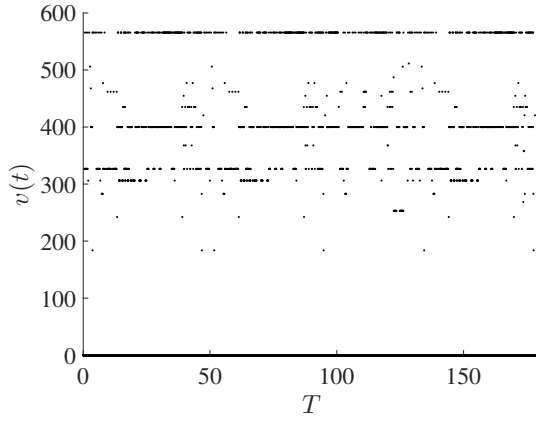
(e) Liszt Ballade No. 2



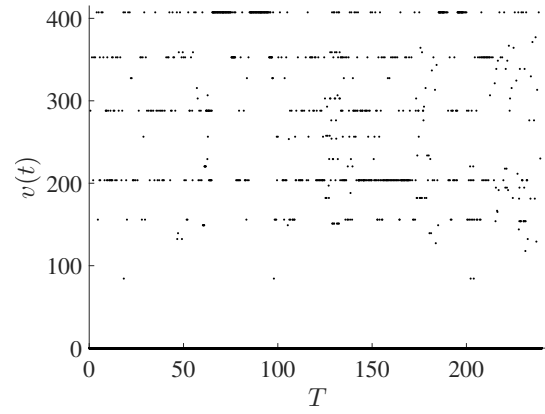
(f) Chopin Ballade in F minor Op. 52

Figure S3. log-log plot for $\mathcal{J} - \mathcal{L}^2/T$.

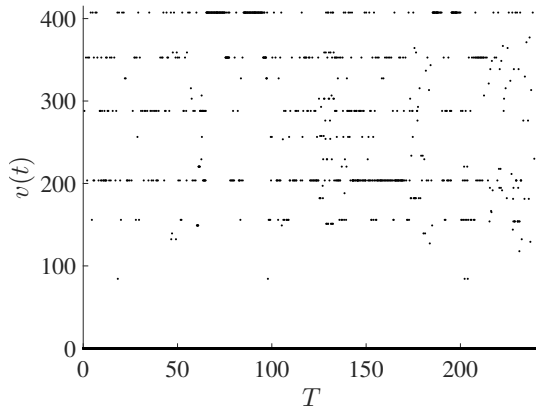
The velocity for each composition not written in the text.



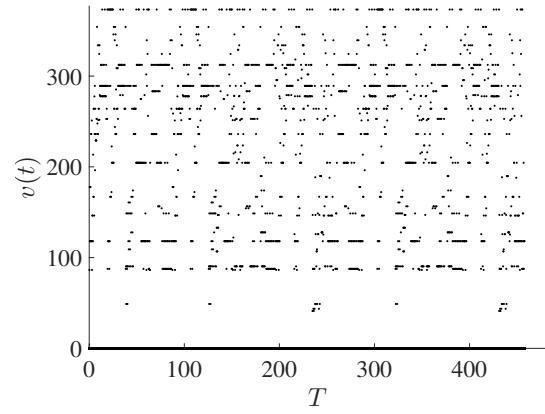
(a) Mozart Piano Sonata



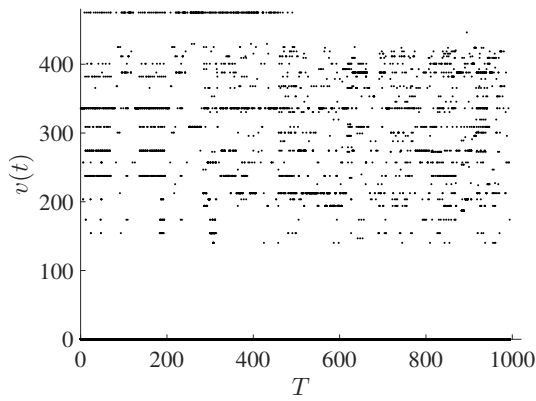
(b) Brahms's string quartet Op. 51



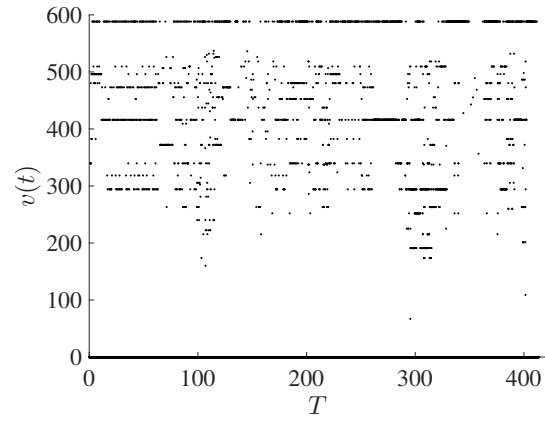
(c) Bach's Brandenburg Concerto No.3
1st Mov.



(d) Bach's Brandenburg Concerto No.3
2nd Mov.



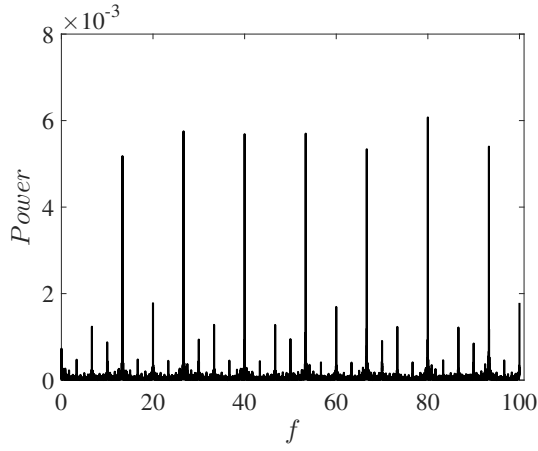
(e) Liszt Ballade No. 2



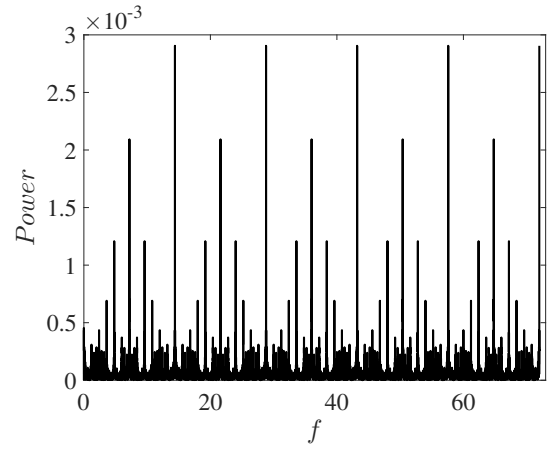
(f) Chopin Ballade in F minor Op. 52

Figure S4. $v(t)$ for each non-featured composition.

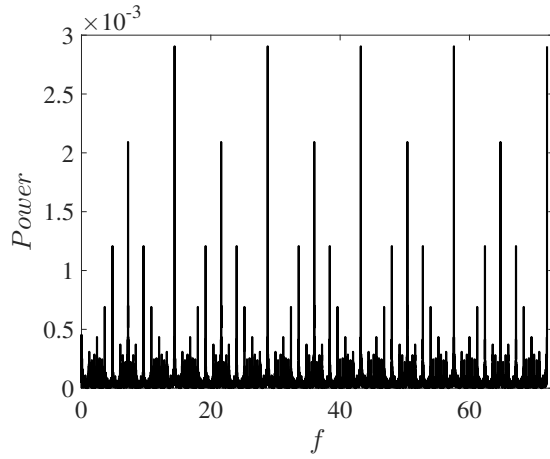
The corresponding power spectrum for the velocity of each composition.



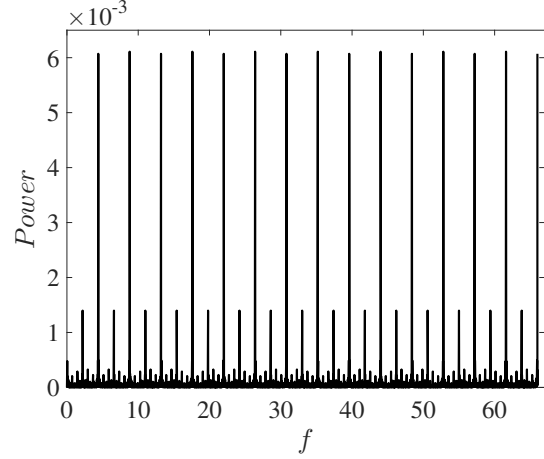
(a) Mozart Piano Sonata



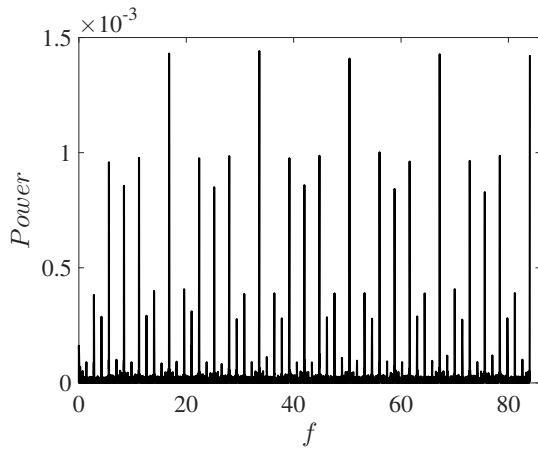
(b) Brahms's string quartet Op. 51



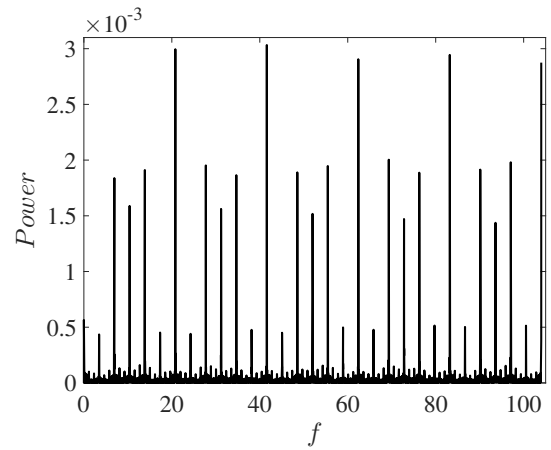
(c) Bach's Brandenburg Concerto No.3
1st Mov.



(d) Bach's Brandenburg Concerto No.3
2nd Mov.



(e) Liszt Ballade No. 2



(f) Chopin Ballade in F minor Op. 52

Figure S5. The corresponding power spectrum's for the above compositions.