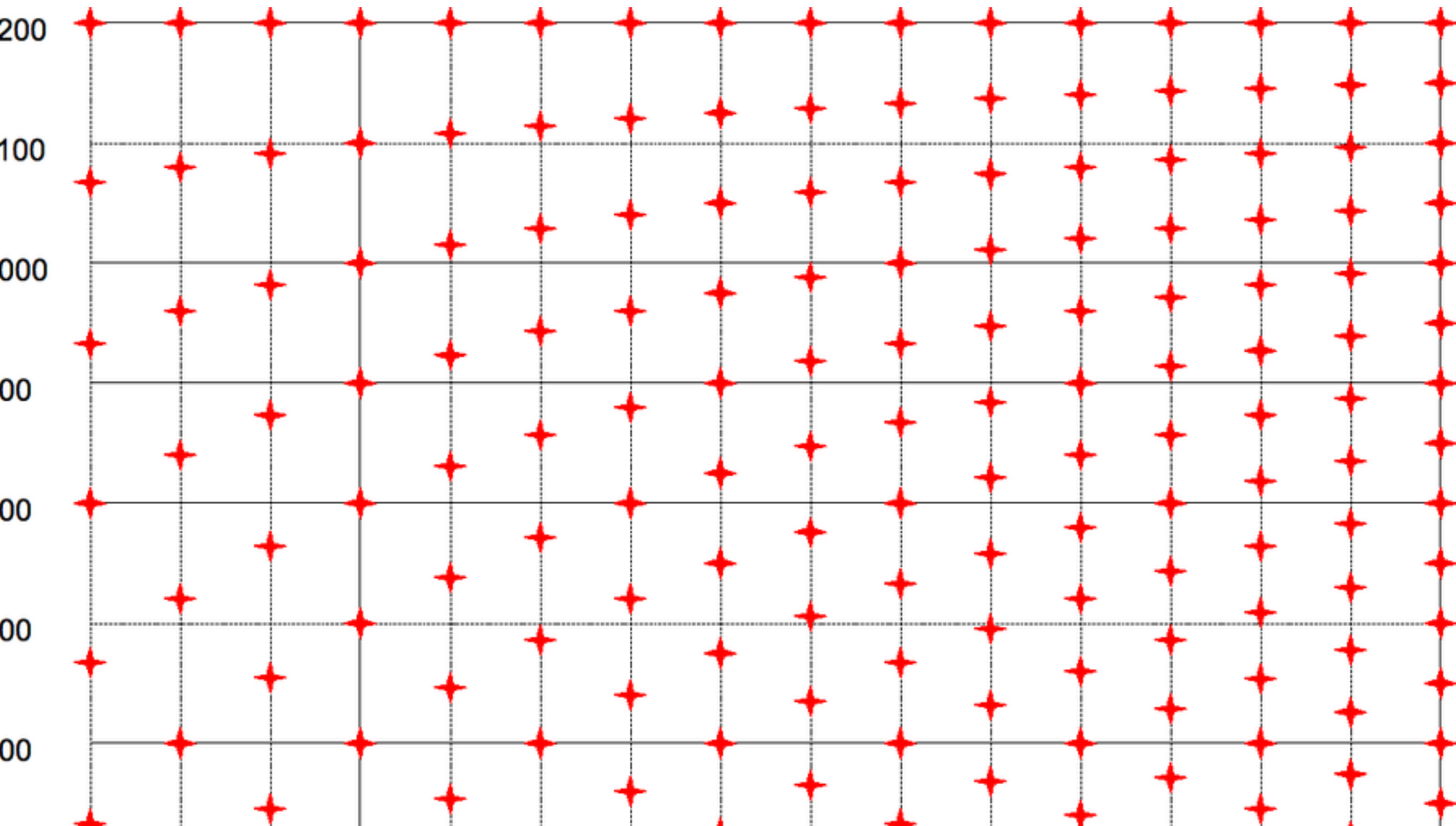
Tuning and T

Today's Class

- What is equal temperament? (also called "equal divisions of the octave", EDO)


200
100
000
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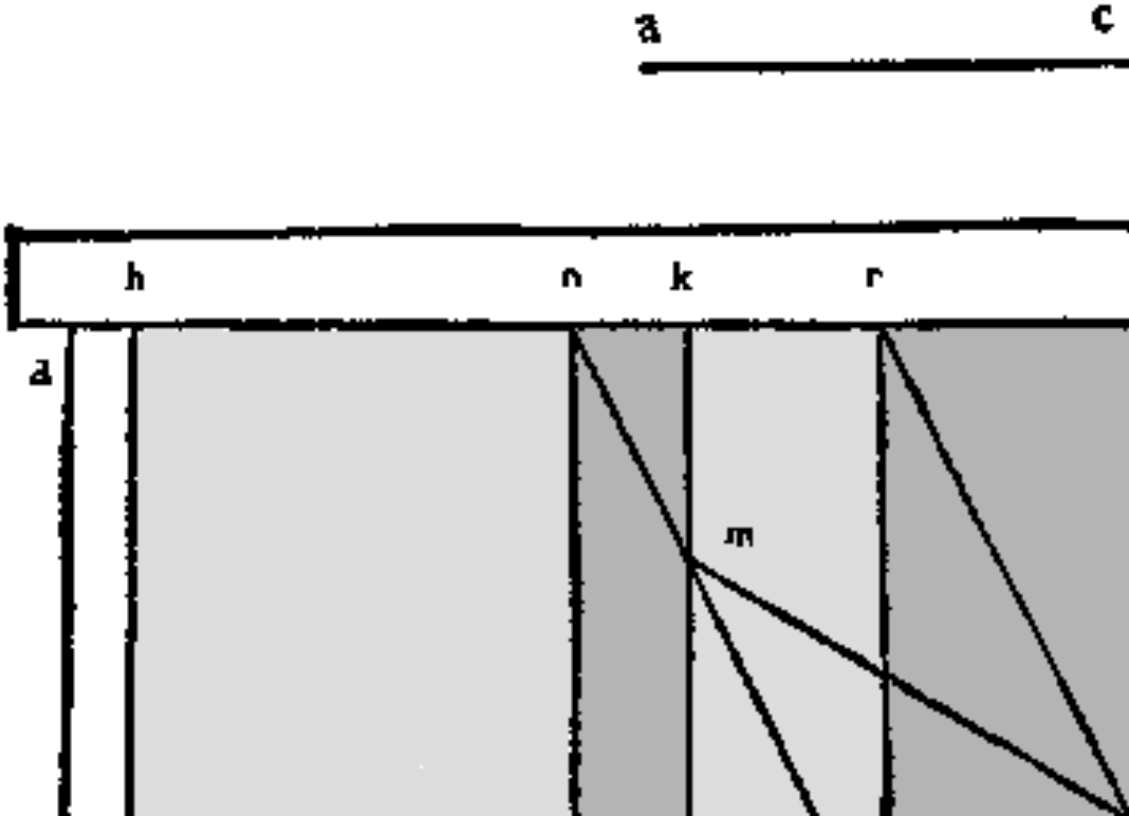
12-tone Equal Temperame

- The dominant system of tuning i
- Essentially, it is a Pythagorean s
  1/12 of a Pythagorean comma.
- If s is the ratio of a semitone, th

The Geometric Mean

Recall that the geometric mean is defined as the nth root of the product of n numbers. Before calculators,

Zarlino, Le istitutioni harmoniche, 96



24-tone Equal Temperame

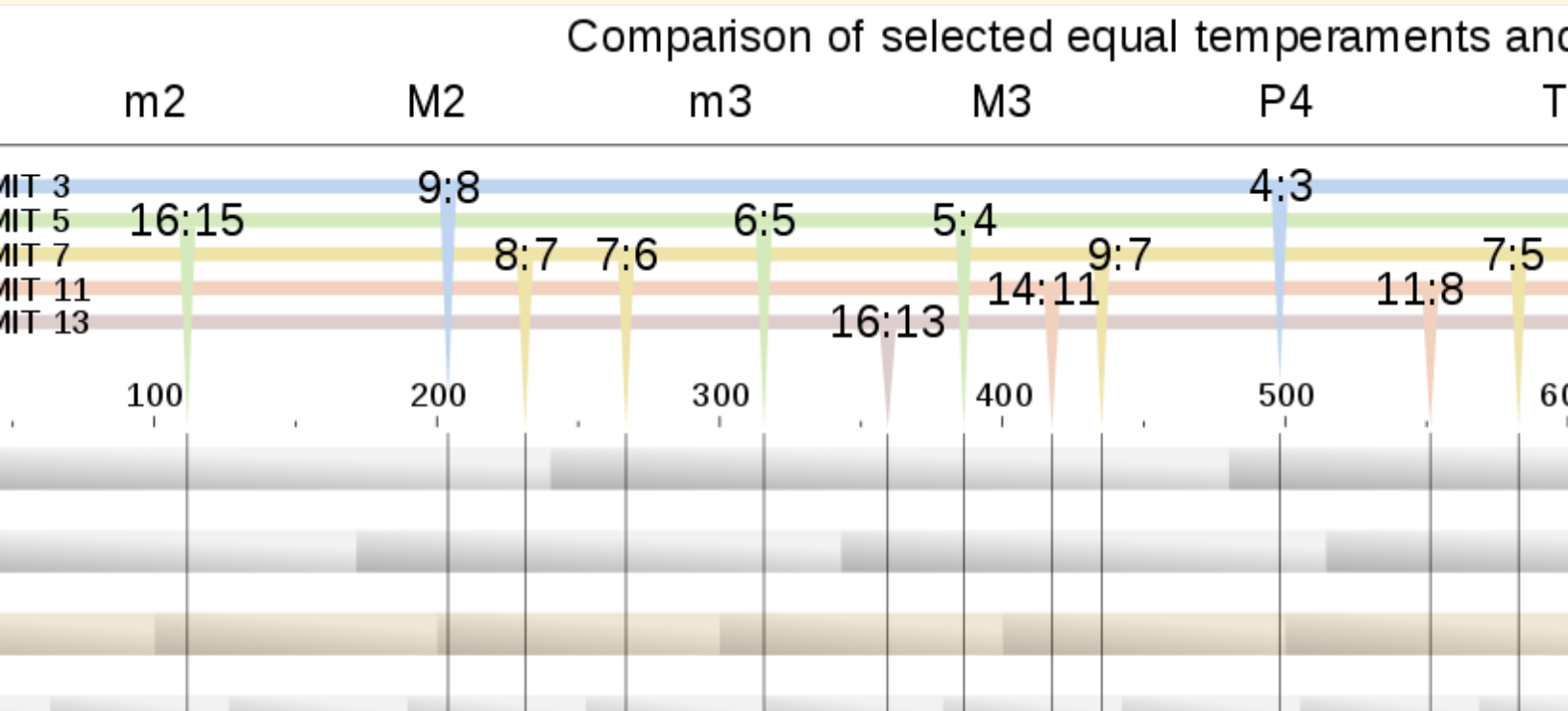
- $s = \sqrt[24]{2} = 50 \text{ cents}$
- Simply, these are quarter-tones
  contemporary music.
- They even have their own accide

Javanese Music

- Gamelan music
- Two main types of scales
  - Pelog (subset of 9-tone equal
  - Slendro

19-tone equal temperamen

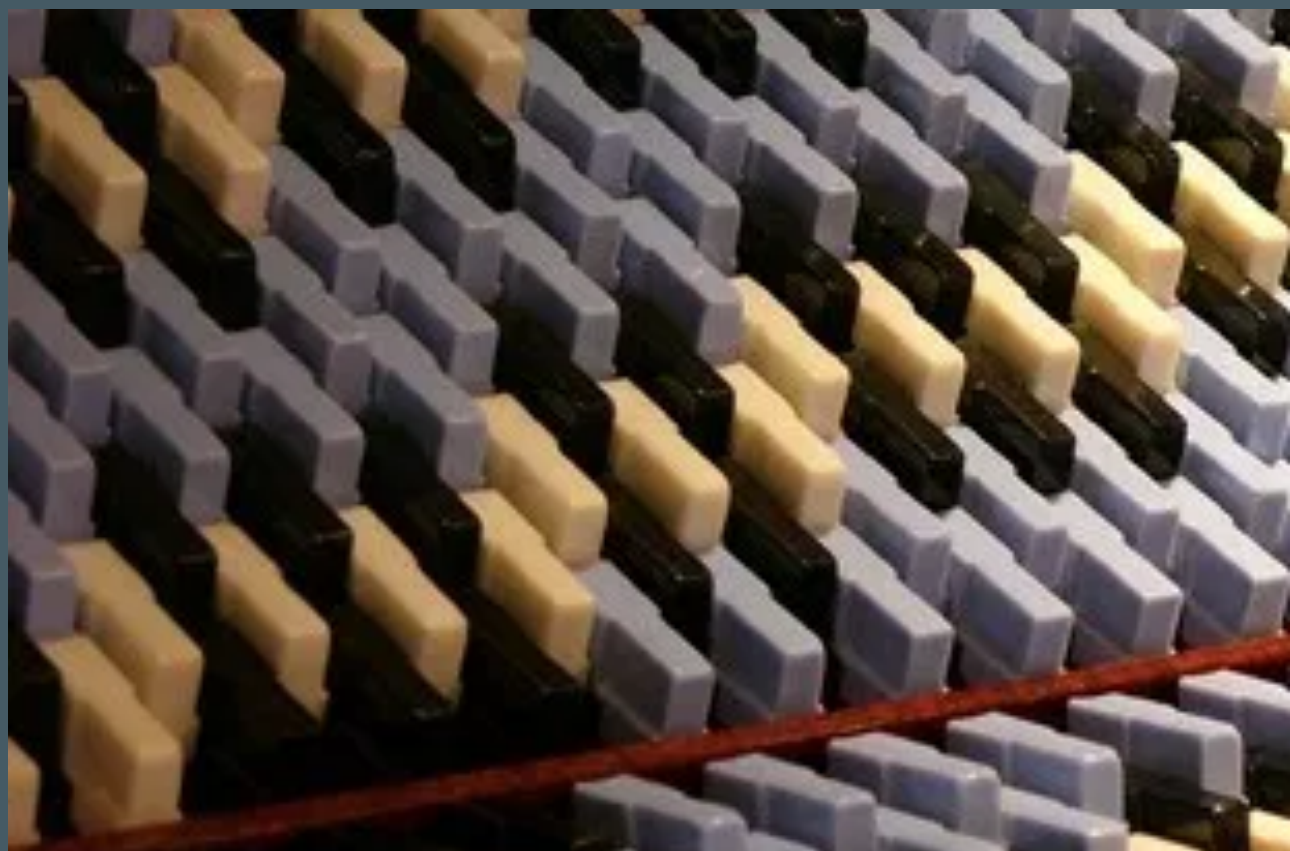
- $s = \sqrt[19]{2} \approx 63.16 \text{ cents}$
- Sounds weird but actually works
- Has very close to just ($\frac{6}{5}$) minor


Comparison of selected equal temperaments and
m2
M2
m3
M3
P4
T
MIT 3
MIT 5
MIT 7
MIT 11
MIT 13
16:15
9:8
8:7
7:6
6:5
5:4
16:13
14:11
9:7
4:3
11:8
7:5
100
200
300
400
500

31-tone Equal Temperame

- ◦ $s = \sqrt[31]{2} \approx 38.702 \text{ cents}$
- Actually theorized quite early.
  - Closely related to 1/4 tone m

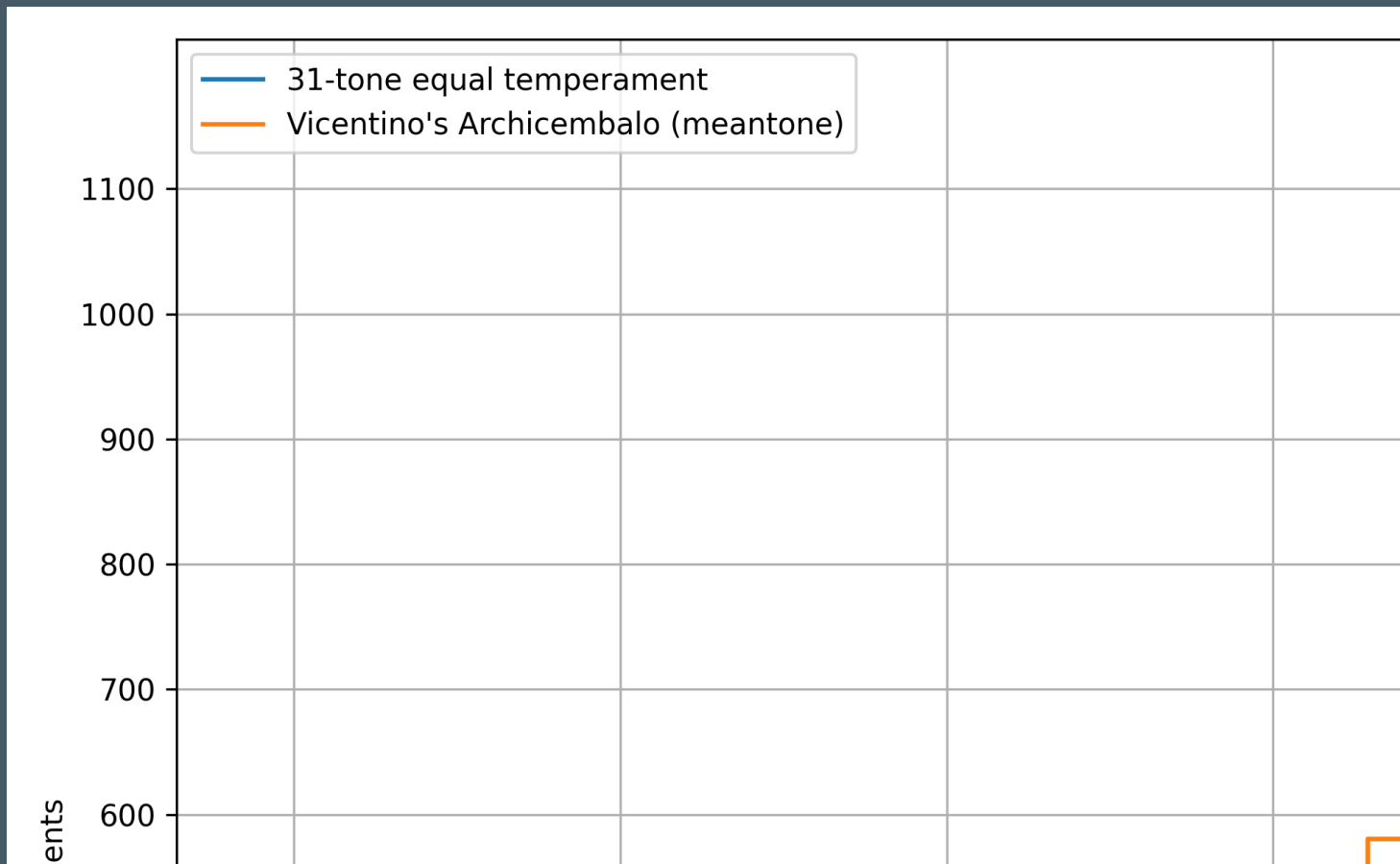
- To the right is one octave on the Fokker Organ.
- Note the different note names and how the colors correspond to the colors of the piano (except blue).

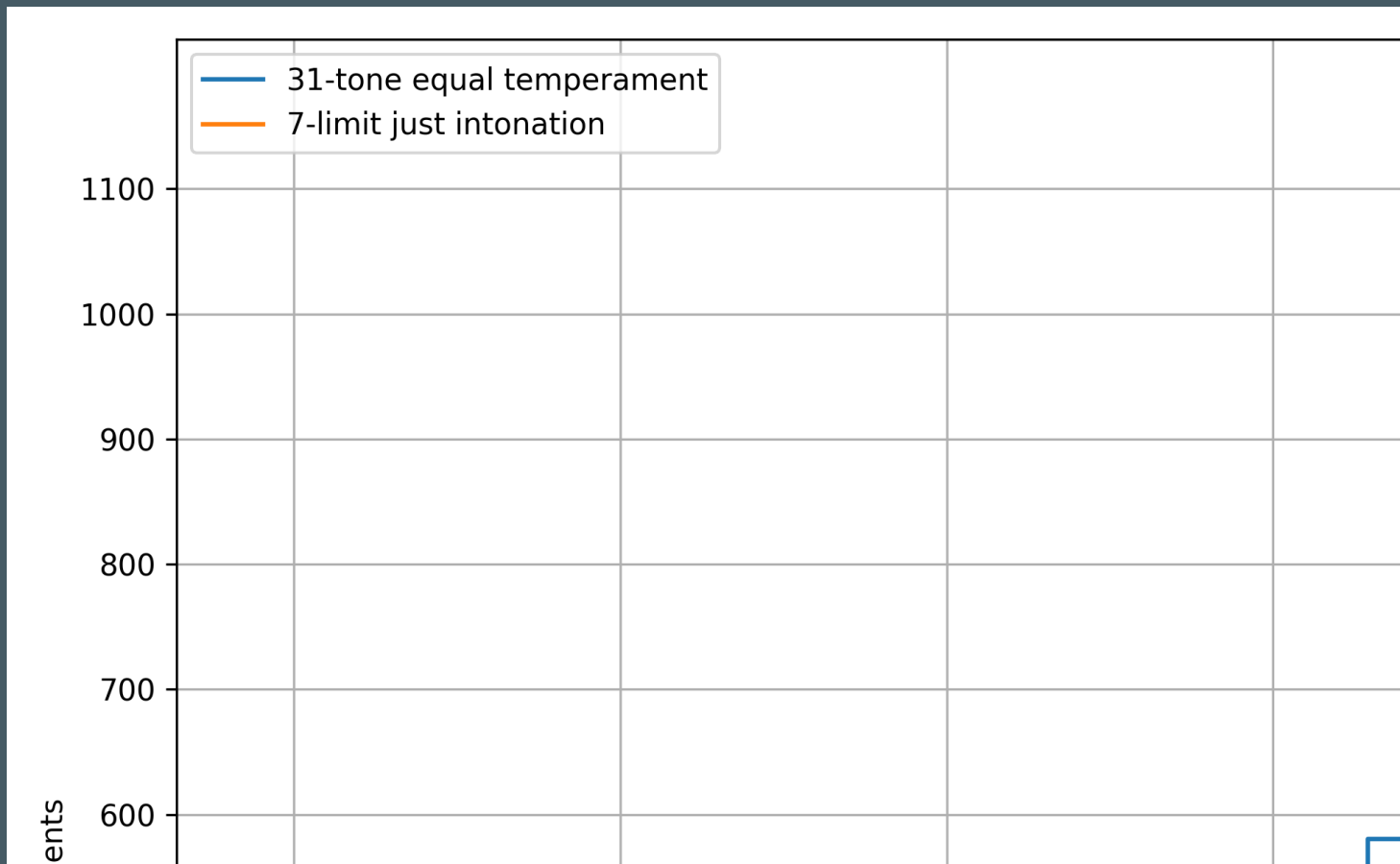


31edo (continued)

By using subsets (modes) of the 31
approximate many different tuning

- 1/4 comma meantone


31-tone equal temperament
Vicentino's Archicembalo (meantone)
1100
1000
900
800
700
600
ents


31-tone equal temperament
7-limit just intonation
1100
1000
900
800
700
600
ents

Are equal divisions of