

Interval Matrix for MET-24, 1/1 = (2/1, 703.711, 57.422)  
 Horizontal = distance on chain of fifths (-11 to 11); Vertical = spacing generators (-1 to 1)  
 Showing the main interval families and transition zones

	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11
1	periseptimal family					central Zalzalian family					septimal family (2-3-7)					pental family (2-3-5)					2-3-17		
	(-11, 1)	(-10, 1)	(-9, 1)	(-8, 1)	(-7, 1)	(-6, 1)	(-5, 1)	(-4, 1)	(-3, 1)	(-2, 1)	(-1, 1)	(0, 1)	(1, 1)	(2, 1)	(3, 1)	(4, 1)	(5, 1)	(6, 1)	(7, 1)	(8, 1)	(9, 1)	(10, 1)	(11, 1)
	716.6	220.3	924.0	427.7	1131.4	635.2	138.9	842.6	346.3	1050.0	553.7	57.4	761.1	264.8	968.6	472.3	1176.0	679.7	183.4	887.1	390.8	1094.5	598.2
	286/189	143/126	169/99	169/132	52/27	13/9	13/12	13/8	11/9	11/6	11/8	91/88	14/9	7/6	7/4	21/16	63/32	77/52	10/9	5/3	5/4	32/17	24/17
	-0.6	+1.2	-1.8	-0.05	-3.2	-1.5	+0.3	+2.1	-1.1	+0.6	+2.4	-0.6	-3.8	-2.0	-0.3	+1.5	+3.2	+0.1	+1.0	+2.8	+4.5	-0.5	+1.2
	n=1	n=2	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10	n=11	n=12	n=11	n=10	n=9	n=8	n=7	n=6	n=5	n=4	n=3	n=2	n=1
0	large/small Zalzalian family					regular diatonic family					large/small Zalzalian family												
	(-11, 0)	(-10, 0)	(-9, 0)	(-8, 0)	(-7, 0)	(-6, 0)	(-5, 0)	(-4, 0)	(-3, 0)	(-2, 0)	(-1, 0)	(0, 0)	(1, 0)	(2, 0)	(3, 0)	(4, 0)	(5, 0)	(6, 0)	(7, 0)	(8, 0)	(9, 0)	(10, 0)	(11, 0)
	659.2	162.9	866.6	370.3	1074.0	577.7	81.4	785.2	288.9	992.6	496.3	0	703.7	207.4	911.1	414.8	1118.6	622.3	126.0	829.7	333.4	1037.1	540.8
	338/231	11/10	104/63	26/21	13/7	88/63	22/21	11/7	13/11	16/9	4/3	1/1	3/2	9/8	22/13	14/11	21/11	63/44	14/13	21/13	63/52	20/11	231/169
	+0.2	-2.1	-1.2	+0.6	-2.3	+0.9	+0.9	+2.7	-0.3	-3.5	-1.8	just	+1.8	+3.5	+0.3	-2.7	-0.9	+0.8	-2.3	-0.6	+1.2	+2.1	-0.2
	n=2	n=4	n=6	n=8	n=10	n=12	n=14	n=16	n=18	n=20	n=22	n=24	n=22	n=20	n=18	n=16	n=14	n=12	n=10	n=8	n=6	n=4	n=2
-1	2-3-17					pental family (2-3-5)					septimal family (2-3-7)					central Zalzalian family					periseptimal family		
	(-11, -1)	(-10, -1)	(-9, -1)	(-8, -1)	(-7, -1)	(-6, -1)	(-5, -1)	(-4, -1)	(-3, -1)	(-2, -1)	(-1, -1)	(0, -1)	(1, -1)	(2, -1)	(3, -1)	(4, -1)	(5, -1)	(6, -1)	(7, -1)	(8, -1)	(9, -1)	(10, -1)	(11, -1)
	601.8	105.5	809.2	312.9	1016.6	520.3	24.0	727.7	231.4	935.2	438.9	1142.6	646.3	150.0	853.7	357.4	1061.1	564.8	68.6	772.3	276.0	979.7	483.4
	17/12	17/16	8/5	6/5	9/5	104/77	64/63	32/21	8/7	12/7	9/7	176/91	16/11	12/11	18/11	16/13	24/13	18/13	27/26	264/169	198/169	252/143	189/143
	-1.2	+1.5	-4.5	-2.8	-1.0	-0.1	-3.2	-1.5	+0.3	+2.0	+3.8	+0.6	-2.4	-0.6	+1.1	-2.1	-0.3	+1.5	+3.2	+0.05	+1.8	-1.2	+0.6
	n=1	n=2	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10	n=11	n=12	n=11	n=10	n=9	n=8	n=7	n=6	n=5	n=4	n=3	n=2	n=1

The regular diatonic family consists of intervals within a single chain of fifths ranging from the diminished fifth (-6, 0) at 577.7 cents to the augmented fourth (6, 0) at 622.3 cents. As Jacobus showed in the *Speculum musicae* or "Mirror of Music" around 1325-1330, there are 14 such intervals from the unison to octave inclusive.

The large/small Zalzalian family consists of middle intervals, and is named for the 'oudist Mansur Zalzal in 8th-century Baghdad, credited with adding to the instrument a middle third fret. These are in Western terms the augmented or diminished intervals, from (-11, 0) to (-7, 0) for the large Zalzalian intervals; and (7, 0) to (11, 0) for the small Zalzalian intervals. The central Zalzalian family (see below) supplements these large and small sizes with "medium-small" and "medium-large" ones.

The septimal family (primes 2-3-7) has smaller intervals (e.g. 14/9, 7/6, 7/4) approximated in the range of around (0, 1) to (5, 1); and larger intervals (e.g. 8/7, 12/7, 9/7) in the range from around (-5, -1) to (0, -1).

The central Zalzalian family has smaller intervals (e.g. 13/12, 13/8, 11/9, 11/6) approximated in the range from around (-5, 1) to (-1, 1); and larger intervals (e.g. 12/11, 18/11, 16/13, 24/13) in the range from around (1, -1) to (5, -1).

The periseptimal family approximates intervals in the "suburbs" of the septimal regions, with smaller intervals in the range of around (7, -1) to (11, -1); and larger intervals in the range from around (-11, 1) to (-7, 1).

The pental family (primes 2-3-5) has smaller intervals (e.g. 8/5-6/5-9/5) in the range of around (-9, -1) to (-7, -1); and larger intervals in the range from around (7, 1) to (9, 1). A caution is in order that these intervals are rather remote and sparse, and also do not support music conceived in a meantone framework.

The far corners of the matrix also include approximations of 17/16 and 17/12 at (-10, -1) and (-11, -1); and of 32/17 and 24/17 at (10, 1) and (11, 1).

These families have "fuzzy" boundaries, with intervals in the fuzzy transition zones having a kind of dual citizenship: thus, for example, (0, 1) can represent either 28/27 (septimal family, small semitone or thirddone); or 33/32 (central Zalzalian family, e.g. 4/3 vs. 11/8). Likewise, 27/26 (7, -1) could be central Zalzalian (e.g. 13/9 vs 3/2) or periseptimal.

! met24-canonical.scl

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Smoothed MET-24 in 2048-EDO, generators (2/1, 703.711c, 57.422c)

24

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- 57.42188
- 125.97656
- 183.39844
- 207.42188
- 264.84375
- 288.86719
- 346.28906
- 414.84375
- 472.26563
- 496.28906
- 553.71094
- 622.26563
- 679.68750
- 703.71094
- 761.13281
- 829.68750
- 887.10938
- 911.13281
- 968.55469
- 992.57812
- 1050.00000
- 1118.55469
- 1175.97656
- 2/1