

Bifurcations

Scott Mc Laughlin

May 2007

Duration 8 mins.

Clarinet Quartet

Bifurcations

Performance instructions

Programme note

Bifurcations is a part of a series of works which takes aspects of chaos/complexity theory as a metaphorical model: in this case I wanted to see how it was possible to use chaotic period-doubling as a structural device.

In the real world, period-doubling can be seen in any system which changes smoothly over time. Most notably in the swirling patterns in flowing water as it becomes more turbulent with increased flow/speed. Bifurcations occur where smooth changes in certain parameters lead to a sudden changes of state where as the system becomes unstable it 'jumps' to a new state which is more complex but stable: period-doubling means that each new state is twice as fast/complex as the last, rapidly leading to chaotic state.

This piece charts a slow increase in harmonic complexity whereby a single chord turns in upon itself, moving through points of stability and instability and the inevitable bifurcations.

General

- Barlines are for co-ordination only and should not be accented, the piece has no metric pulse.
- Apart from the accented *forte* pitches, all notes should be faded in from nothing and fade out to nothing: the four players should blend together into one sound. On different instruments, some microtonal fingerings will not allow fading from nothing, do the best you can with these.
- Before the piece, clarinets II and III are required to detune their instruments by approximately $\frac{1}{4}$ tone by pulling out the barrels slightly.
- All of the microtones in the score can be achieved by covering holes further down the barrel or by lipping down (preferably before attacking the note to avoid a sudden and intrusive pitch-bend).

Microtones:

	♭	♭	♭	♮	♮	♮	♮	♮	♯	♯	♯	♯	♯
Offset in cents:	-150	-125	-100	-75	-50	-25	0	+25	+50	+75	+100	+125	+150

The microtones used in the score are idealised. The player should treat them as points to aim for, a degree of intonational latitude is assumed.

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♩ = 50

Clarinet I in B \flat
ff \rightarrow *p* \leftarrow *f* (Same dynamics until indicated)

Clarinet II in B \flat -1/4tone
ff \rightarrow *p* \rightarrow *f* (Same dynamics until indicated)

Clarinet III in B \flat -1/4tone
ff \rightarrow *f* (Same dynamics until indicated)

Clarinet IV in B \flat
ff \rightarrow *p* \leftarrow *f* (Same dynamics until indicated)

Detailed description: This block contains the first six measures of the piece for four clarinets. Each part is written in treble clef. Clarinet I starts with a dynamic of *ff*, moves to *p* in the second measure, and returns to *f* in the third measure. Clarinet II starts with *ff*, moves to *p* in the second measure, and returns to *f* in the third measure. Clarinet III starts with *ff* and moves to *f* in the second measure. Clarinet IV starts with *ff*, moves to *p* in the second measure, and returns to *f* in the third measure. All parts feature a melodic line with slurs and accents, and rests in the other hand. The tempo is marked as quarter note = 50.

Cl. 7 (slow lip bend)

Cl. (slow lip bend)

Cl. (slow lip bend)

Cl. (slow lip bend)

Detailed description: This block contains measures 7 through 12 for four clarinets. Measure 7 is marked with a '7' above the first staff. Clarinet I has a melodic line with slurs and accents. Clarinet II has a melodic line with slurs and accents, and a 'slow lip bend' instruction with an arrow pointing to a note in measure 8. Clarinet III has a melodic line with slurs and accents, and a 'slow lip bend' instruction with an arrow pointing to a note in measure 7. Clarinet IV has a melodic line with slurs and accents, and a 'slow lip bend' instruction with an arrow pointing to a note in measure 12. The tempo is maintained from the previous section.

14

Cl.
Cl.
Cl.
Cl.

This musical system contains measures 14 through 20. It features four staves, each labeled 'Cl.' on the left. The top staff (Cl. 1) begins with a treble clef and a key signature of one flat (B-flat). It contains a melodic line with a series of eighth notes, each beamed together and marked with a fermata. The second staff (Cl. 2) has a similar melodic line but includes some chromatic movement and slurs. The third staff (Cl. 3) provides a harmonic accompaniment with a steady eighth-note pattern. The bottom staff (Cl. 4) also features a melodic line with slurs and some chromaticism. Vertical bar lines separate the measures.

21

Cl.
Cl.
Cl.
Cl.

This musical system contains measures 21 through 27. It continues with the same four-staff arrangement. The top staff (Cl. 1) maintains its melodic line with fermatas. The second staff (Cl. 2) shows more complex rhythmic patterns and slurs. The third staff (Cl. 3) continues with its accompaniment. The bottom staff (Cl. 4) has a melodic line with various slurs and articulations. Vertical bar lines separate the measures.

28

Cl.
Cl.
Cl.
Cl.

35

Cl.
Cl.
Cl.
Cl.

ff *f*
ff *f*
ff *f*
ff *f*

42

Cl.

Cl.

Cl.

Cl.

49

Cl.

Cl.

Cl.

Cl.

55

Cl.
Cl.
Cl.
Cl.

60

Cl.
Cl.
Cl.
Cl.

ff > *p* — *f* — *p*

ff

ff

ff > *p* — *f* — *p*

80

Cl.
Cl.
Cl.
Cl.

pp
pp
pp
pp

pp
pp
pp
pp

85

Cl.
Cl.
Cl.
Cl.

ppp
ppp
ppp
ppp

ppp
pp
ppp
ppp