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Analysing Experimental Techno

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Abstract

Experimental Music can be described as a compositional tendency in music that extends the boundaries of any predefined genre through the exploration of production techniques and the manipulation of sound. It incorporates elements of unpredictability, nonlinearity in structure, as well as having a research character. In this sense, the genre Techno is experimental, its name originating from the technological progress in production and sound, bringing forth numerous variants and styles.

In this paper we will show three analyses of avantgarde Techno productions based on sonograms generated by the software eAnalysis. The analysis is focused on the musical impact and therefore includes the segmentation of the piece into sound layers, as well as the observation and description of the interactions between them. The key parameters found are rhythmic interactions of sound layers, rhythmic nonlinearity and the emergence of different "classical" form elements built by sound layers that "play" with the straight rhythmic base that Techno tends to be reduced to.

Introduction

Thom Holmes suggested that technology automatically leads to experimentation, creating new sounds, styles, and techniques for making music (Holmes, 2016 p.369). This corresponds to our understanding of experimental aspects in electronic music. The exploration of production techniques and the manipulation of sound leads to new musical material and to the discovery of unforeseen musical events. Experimental music incorporates elements of unpredictability and nonlinearity in structure. This explores the possibilities of a refined awareness by interfering with our familiar perceptional patterns. At the same time, the ability to interpret is challenged and associative listening is encouraged.

In spite of its high tendency to self-similarity, Techno can be considered experimental. Labels such as Avian, Bedouin, Pan, Posh Isolation, and Raster-Media explore the margins of experimental electronic music. The use of electronic devices is the base of creating sounds and their organization. Thereby, the rhythm and its temporal structure form the essential compositional features. As a basic principle, sound is periodically arranged in time. Modifications of these repeating elements break the regular order and give spontaneity to individual segments. Techno is composed by layering rhythmical loops and combining them to create interacting structures. The average sound palette of the genre is strongly influenced by the use of drum machines. Their electronic drum sounds usually form the basic rhythmical patterns. Melodies and effects are layered on top of these patterns.

In contrast to Mark Butler's performance-based analyses, we are describing the realization of experimental elements in Techno. We are focusing on the musical effects of these elements and show them in three examples. Our points of interest are the sound material, rhythmical density, structural irregularity, and spatial movement.

The base of the analyses are sonagrams generated with the Software eAnalysis (Couprie, 2016). The variable analysis system developed for this purpose (Brech 1994, 2018) uses the principles of Gestalt theory established in the early 20th century by Max Wertheimer et al. Albert Bregman validated and enhanced the theory with empirical research findings in music psychology (Bregman 1990). Through segmentation and separation, the auditive system extracts vertical structures (form and rhythm elements) and horizontal, parallel running, sound layers from a sonic environment due to similarity principles. Similar sounds connect to so-called streams (Bregman 1990), which can be used to define the musical elements of a composition. The structural progression and interaction of these elements can subsequently be analyzed and interpreted. In the following three examples we will define the sound layers in the compositions and analyze interactions between them.

We need to keep in mind that, as Ramsey (2016) has pointed out, Techno music is mixed and mastered for powerful sound systems with a focus on the bass frequency range, and the perception of the music can vary based on the reproduction system.

Analysis 1: *Rand Weiss - an_tr02_sl*

The first analysis is an extract from *an_tr02_sl* by the German electronic musician Martin Weiss, who is known as *Rand Weiss* (track released 2018 by the label KÆR´UIKS). The elements of Techno music in this piece are subverted and presented with a different aesthetic through fragmented, cut and stuttered sounds. The interplay of these uncommon sound materials and the density of elements is a key characteristic.

Compositional Structure

The overall structure of *an_tr02_sl* consists of three different parts following an ABA form, as shown in figure 1. Part I consists of an introduction, which builds the fundament of the track. From then on A1 and A2 are variations of the introduction. Part II followins as a break, in which B1 and B2 interrupt the previous sounds of A2 through different small breaks. Further, Part III is an adaption of Part I and is marked by a change in the density of the pattern. It is succeeded by the concluding "outro" which disrupts the previous sounds through breaks before slowly fading out.

Selection A

The Selection A between Part I (A1, A2) and Part II (B1), displayed in figure 1.2, gives an overview of the elements used in the piece. In this, nine different sounds can be distinguished.

The rhythm consists of kick drum, bass drum, and digital percussion sounds that are interrupted by individually crafted sounds, such as the snap, crash, interference, laser, sonar, and synthesizer sounds. Further on, the standard emphasis on quarter notes moves to triplets within the piece, which are successive (see figure 2 kick sound). Also, it can be noted that between parts I and II is no continuous meter, suggesting a fragmented atmosphere that generates attentiveness in the listener.

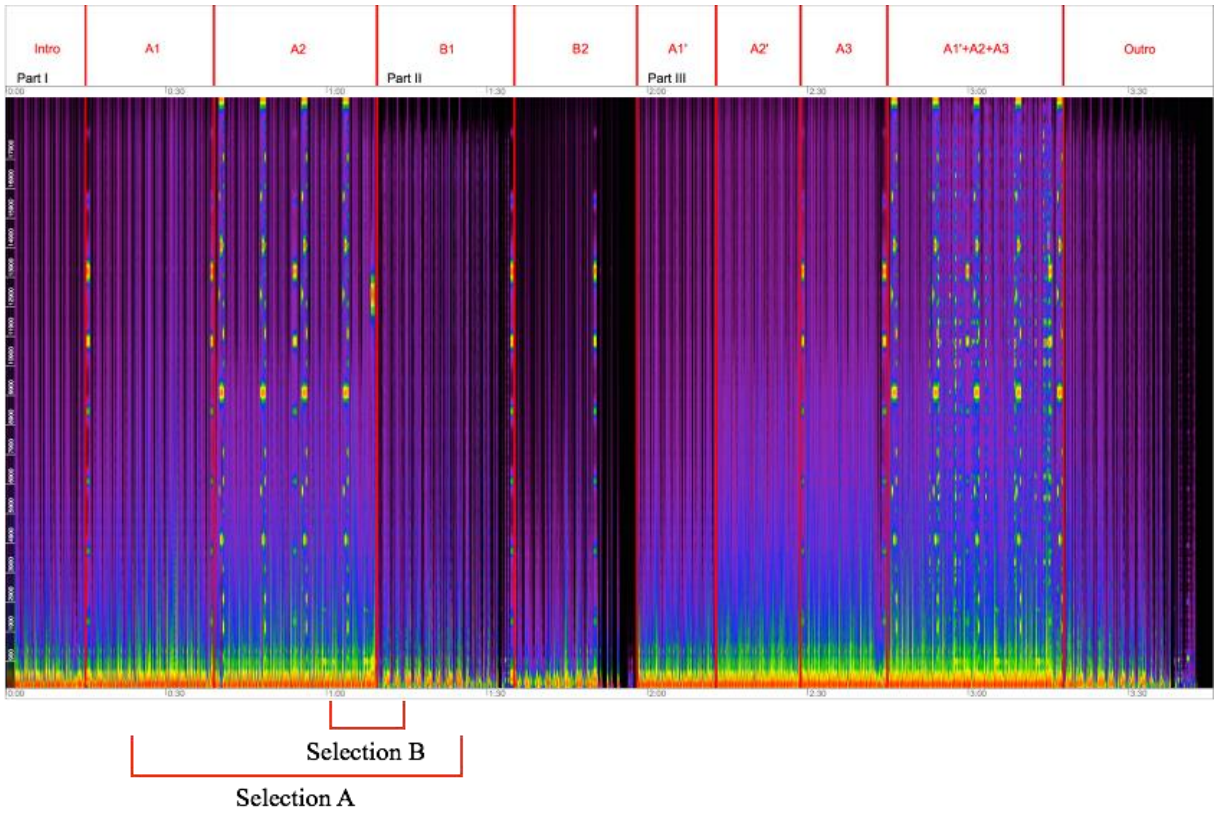

Figure 1.1: Sonagramm compositional structure of *an_tr02_sl*, 0'00"-3'46" (eAnalysis, linear).

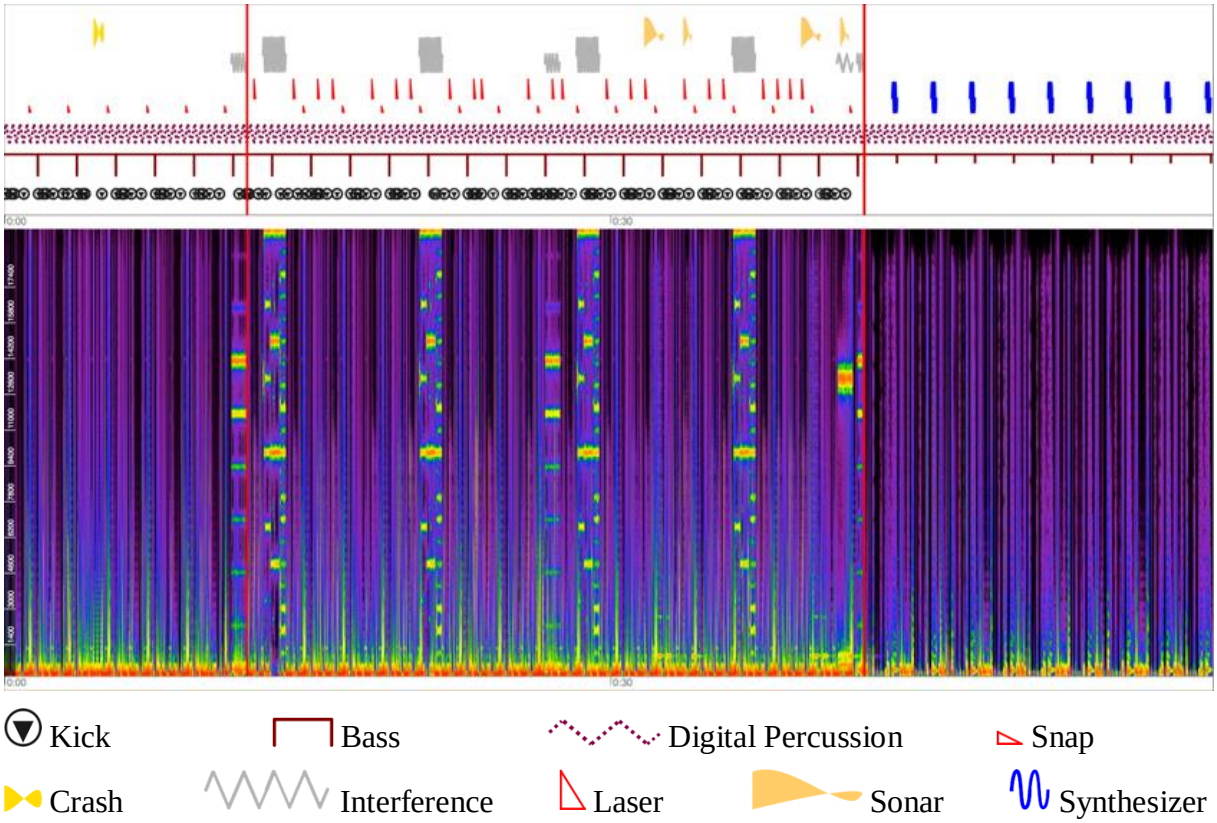

Figure 1.2: Sonogram Selection A, of the transition from Part 1 to Part 2, 0'20"-1'20" (eAnalysis, linear).

Selection B

The Selection B (Figure 1.3) zooms further into the sound qualities and transitions between parts I and II. Part I, A2, is defined by four elements that create a pattern that loops every 2 sec. This loop consists of a kick programmed at a tempo of 124 BPM (beats per minute in quarter notes). The frequency range is between 40 and 800 Hz, and the kick can be described as a banging, snapping sound. Thereby the bass creates the melodic content that lies between 30 Hz and 1.2 kHz. Furthermore, a digital stuttering percussion lies on top, in the range from 250 Hz to 2 kHz, creating movement inside the piece. Finally, a snap sound appears at the end of each looped sequence, emphasizing the pattern. Between A2 different interference sounds appear that structure and divert the attention further. The interference sounds are noise bursts that mask the other sounds through variations in the overtone spectrum (compare figure 1.3). The attack and decay of the laser sound appears to be a crescendo and is so pushed to the foreground. The sonar-like sound almost fades to the background, and the one directly following seems like an echo that almost fades away. At B1 in Part II, the break part of *an_tr02_sl* starts. The kick disappears and the lower frequencies are cut off in the bass. This leads to small breaks and fragmentation in this ambit. The digital percussion continues from A2 and fills in the breaks. After all of this, the snap sound at the end of each loop is replaced by a synth, by this means creates melodic content.

Interpretation

The analysis of *an_tr02_sl* shows that it contains Techno-specific elements like beat and variations that are replaced with irregular, untraditional sounds creating interactions between the layers as well as structural density. In this way, the combinations of groupings play with the dynamics of fore- and background movements and contribute to the experimental character of the piece.

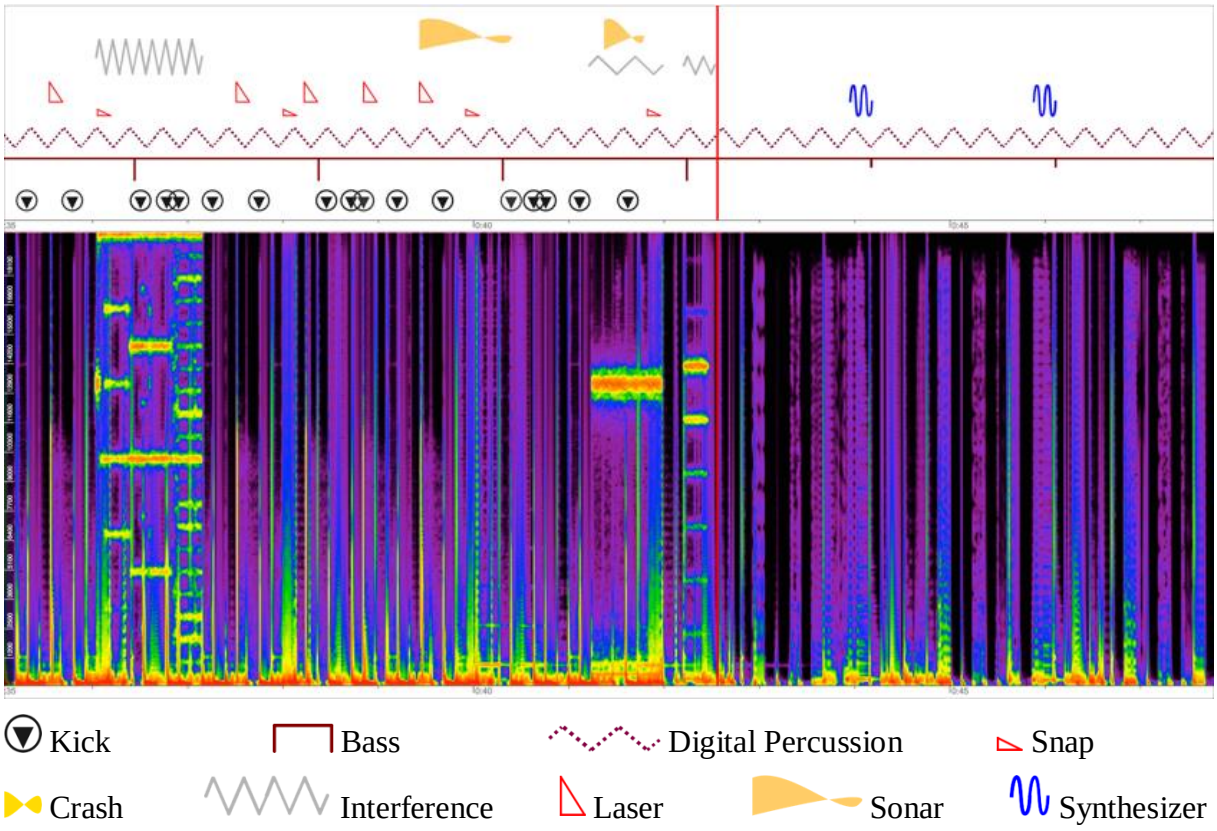

Figure 1.3: Sonogram Selection B, of the transition from Part 1 to Part 2, 1'00"-1'15" (eAnalysis, linear).

Analysis 2: *Age Coin - Damp*

Kristian Emdal and Simon Formann from Sweden perform under the name *Age Coin* In January 2017 they released *Damp* on their album *Performance*, distributed by the label Posh Isolation. The label specializes in experimental Techno. Usually, *Age Coin* perform *Damp* live by layering and varying the sound material chosen for that piece. For the CD-publication, however, they produced a fixed form of the work. There it is an experiment of constant variation and reoccurrences of mostly prerecorded noises and a few sounds from electric instruments. In particular, the intro of *Damp* is an outburst of:

- new sounds,
- irregular forms,
- triple patterns, some of them in fivefold repetition,
- irregular layering of different sound streams, and
- two silence breaks on base of a regular metre that is hidden by constantly repeated but irregular rhythmic patterns.

Only the penultimate element from this list resembles typical Techno, although occasionaly repeated irregular rhythmic patterns replace the ordinary Techno 4-beat-per-bar bass drum at a tempo of 120 BPM.

All this makes the intro of *Damp* a perception experiment, too. But due to individual perception strategies it cannot be predicted although interactions between sounds or sound layers are obvious.

Analysis (Introduction)

Within the introduction, lasting about 45 seconds, five different sounds appear (A–E). Owing to the long presence, most of them form a sound layer, while some remain single events that are repeated in some occurrences.

(The graphical symbols refer to the sonogram graphics 1 and 2, which show the complete introcution.)

A: (b)  (a)

A loud, noisy sound formed as an attack with short decay (a). The sound appears five times in variations and in irregular appearance. It is always varied and sometimes combined with another, softer sound with a duration of 0.3 sec (b).

B:  when repeated, reduded to

A second noisy sound formed to triple patterns that are repeated regularly. The sound layer begins at about 0.4 sec and remains in the foreground. At about 12 sec it becomes much softer, and from then it remains in the background until 16.3 sec.

The most interesting aspect of this sound layer is the rhythm of the triple patterns (short, long, long), because it does not use the usual European dual-rhythm division system. Instead, it is divided in the mathematical proportions 1, 1.6, 1.6.

C:  when repeated, reduded to

Another triple pattern loop appears at 3.5 sec, using other short, noisy attacks. Its tempo is higher and so the repetitions are much quicker than in layer B. The pattern is mirror symmetric to the B-layer pattern, owing to different accentuation—but it might be perceived differently because of the change of listening strategies, especially if the listener concentrates on the interaction between layers B and C.

The sound layer is subject to changes within its appearance up to 32 sec. Gradually, it becomes louder and moves from the middle to the left of the stereo panorama. Additionally, sound quality becomes somewhat softer, having attacks that are less sharp.

D: Variations: (a): , (b) , (c)  repetition reduction: , (d) , (e): 

Shortly after the fourth appearance of sound A, the fourth sound layer starts at 16.3 sec Compared to the others it is the one with the most variations or changes during its appearance in the introduction, and it ends at 40.4 sec.

Low frequency dominates, and noisy sounds begin loudly in a series of ten equally long durations (a). At 21.2 sec the sound melts into a softer period and indefinable rhythmic organisation that lasts for 2 sec (b). After a short break, the sounds reappear at 24 sec in two shorter attacks and form a triple pattern of type B (c). It also uses the tempo from sound B for its five appearances. At 30.2 sec it is varied in three different frequencies, which are formed into an upwards movement (d) each about 0.4 sec in duration. Another fivefold repeated triple pattern begins at 32 sec, ending at 36.7 sec. Shortly after this, at 37 sec, the sound layer again becomes soft and rhythmically indefinable. Between 39 and 40 sec, the layer seems to be divided into two different streams: One continuing the former rhythmically indefinable layer, and the other a (musical) triplet formation of equal lengths (e).

E: 

The sound layer is predominately a mixture of silence and sounds, and in part an interaction with the preceding Layer D, Two triplets of equal length, as in the layer D triplet pattern, form the new sound: very-low-frequency attacks are audible, and they seem be produced at a distance; the sonogram shows reverberation effects that are different in the second appearance. Here, the reverberation appears in a reversed version as well, so that it precedes the first attack of the third triplet that appears after a 2.5-sec period of silence at 44.3 sec. It is followed by a second period of silence lasting 2.1 sec.

Because of the mixture of silence and sounds that follow each other, this layer could also be understood as a unique part of the introduction. Nevertheless, the sound of the two triplets is new and thus forms a new sound layer while the rhythmic pattern interacts with layer D (thereby forming an overlap between the two layers). On the other hand, it would not make sense to call silence another sound layer: It only exists as an in-between-sound element, and its length interacts with the sounds around it. It is a kind of horizontal layering—just as it is a reference to the early years of experimental music, when periods of silence were a topic of this very compositional style.

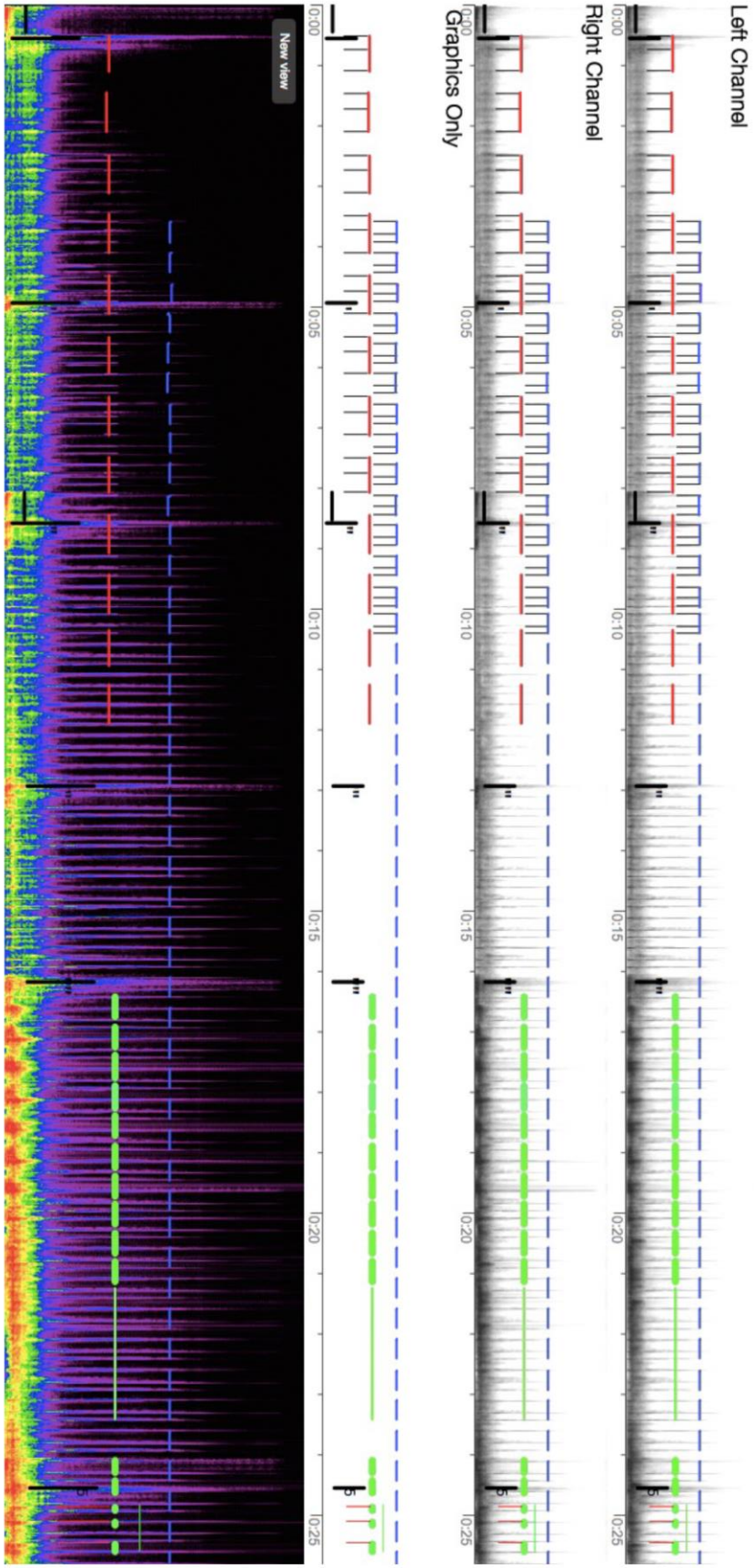

Figure 2.1: Sound layers of Damp 0" – 0:25,5" (eAnalysis, linear)

A: (b) (a) in 5 variations, B: when repeated reduded to: , C: when repeated reduded to:

D: Variations: (a): , (b) , (c)

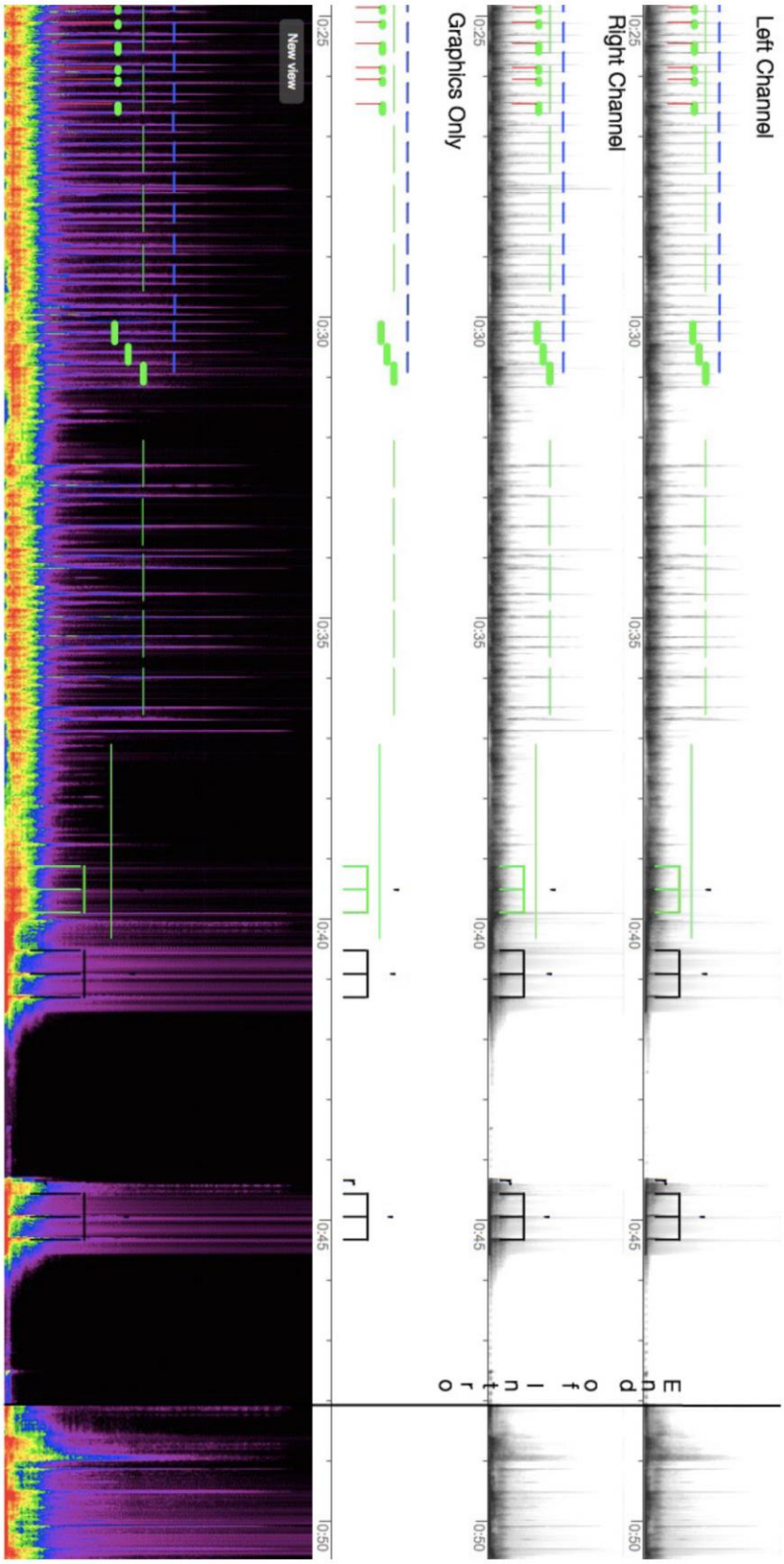

Figure 2.2: Sound layers of Damp 0:25” – 0:50,5”; End of Intro-Part at 48” (eAnalysis, linear)

D: Variations: (d) ⌐¬, (e): ⌐ ¬; E: ⌐¬

Analysis 3: *Vofa - Lisiaxte*

The last example is the track *Lisiaxte* by *Vofa*. The Athens-based duo released this track in November 2017 on their EP *Vitsia* distributed by the label *Kafta*. The analysis focuses on sound texture and spatial movement within the composition.

The four rhythmic layers in this track do not represent typical drum sounds. The synthesized sounds cover the complete audible frequency spectrum and can be separated into five different layers. In the beginning there is a bass sound, transients and strikes. At 0:30 a noise layer fades in and develops a vowel-like modulation on top at 0:45. The last layer of the analyzed section is a resonance starting at 1:40.

The rhythmical framework of the piece is based on a tempo of 120 BPM. The bass, transient and noise layers are played in sixteenth notes throughout the whole track. The strikes are played in quarter-note triplets with variations from 1:20. The use of triplet patterns creates shifts against the straight rhythmic base of the other layers in the composition. This rhythmic nonlinearity engages interactions between the sound layers. In the first section of the piece only three sound layers are present.

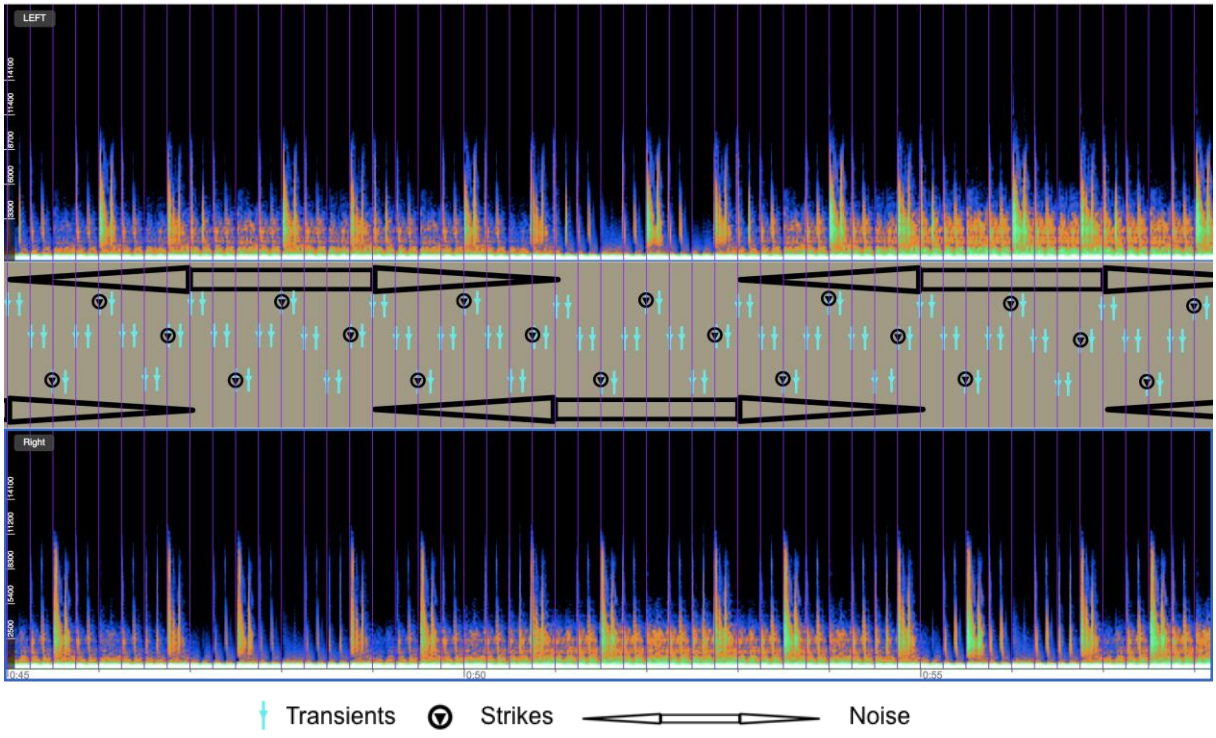

Figure 3.1: Rhythmical structure in the stereo field, 0:45–1:00 (eAnalysis, linear).

A central characteristic of the track is the movement of layers in the stereo field. Production formats with more than two channels are rarely realized in Techno because of the use of turntables and stereo players for DJ performances. There would, however, be possibilities to use multichannel audio, many clubs have four-point sound systems with additional subwoofers installed.

The intricacies of the spatial movement within the sound layers reveals a complex interaction between them. The first spatial movement takes place in the transient layer. The sound

changes position from the left to center, and then to the right of the stereo image. The movement occurs on every second sixteenth note played. This movement alternates continuously between hard-left and hard-right panning. The pattern of the movement is visualized in figure 3.2.

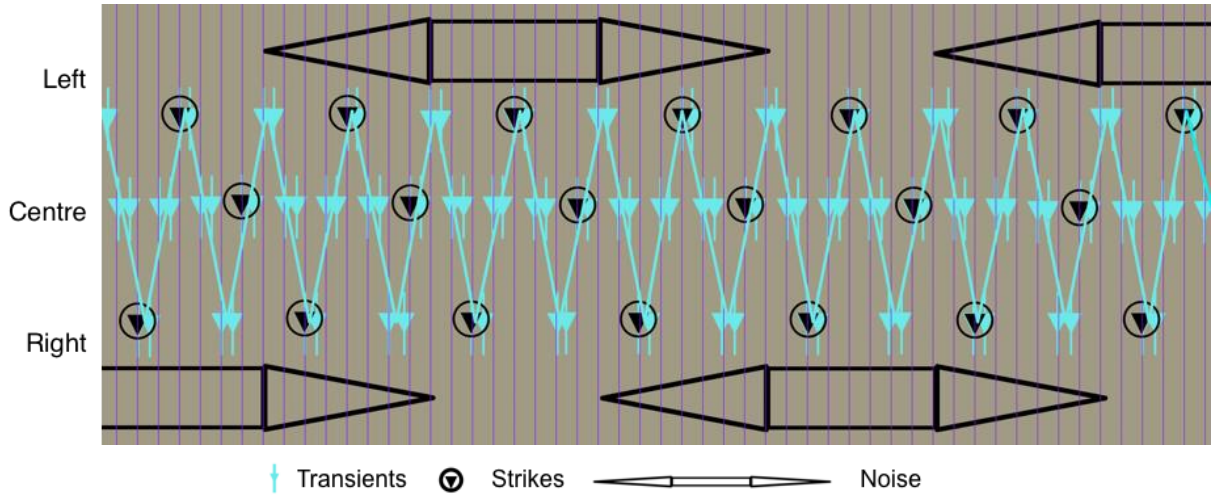

Figure 3.2: Spatial movement A of the transient layer (eAnalysis, event outline).

The second movement occurs in the strike layer. Every six sixteenth note there is one strike, which makes it a triplet pattern. The movement goes from left, to center, to right and then directly back to left. This movement builds up a contrary motion into a single direction, compared to the alternating faster movement of the transient layer. The variations of the panning pattern caused by the shifting interactions of the layer movement confuses the perceived direction of the movement.

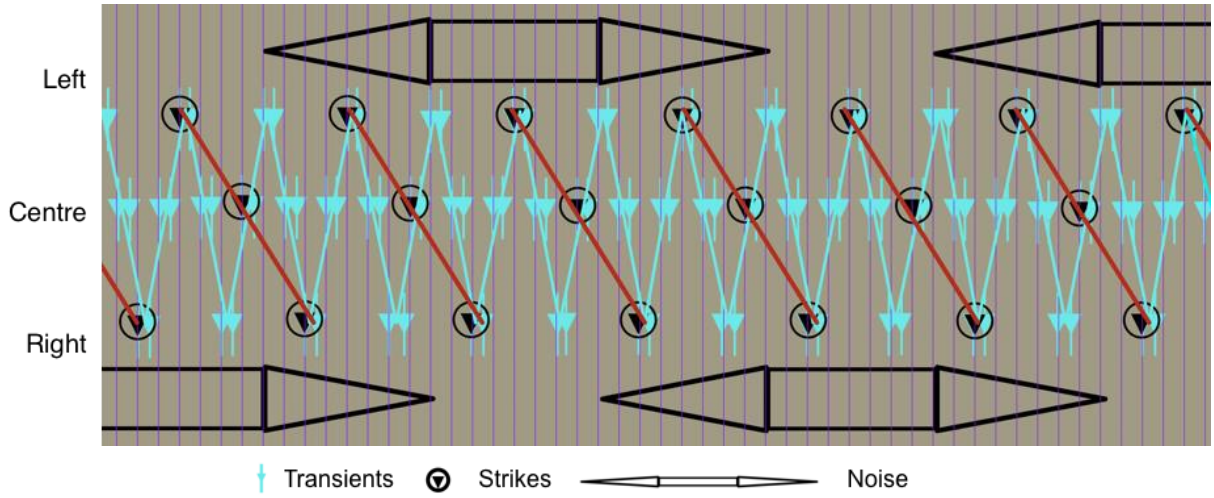

Figure 3.3: Spatial movement B of the hit layer (eAnalysis, event outline).

The spatial movement of the noise layer is the slowest fluctuation in the track. It fades from hard-left to hard-right panning for four quarter notes, then stays there for another four quarter notes before fading back to the opposite side. This slow alternating movement creates a third layer of shifting interaction in the composition.

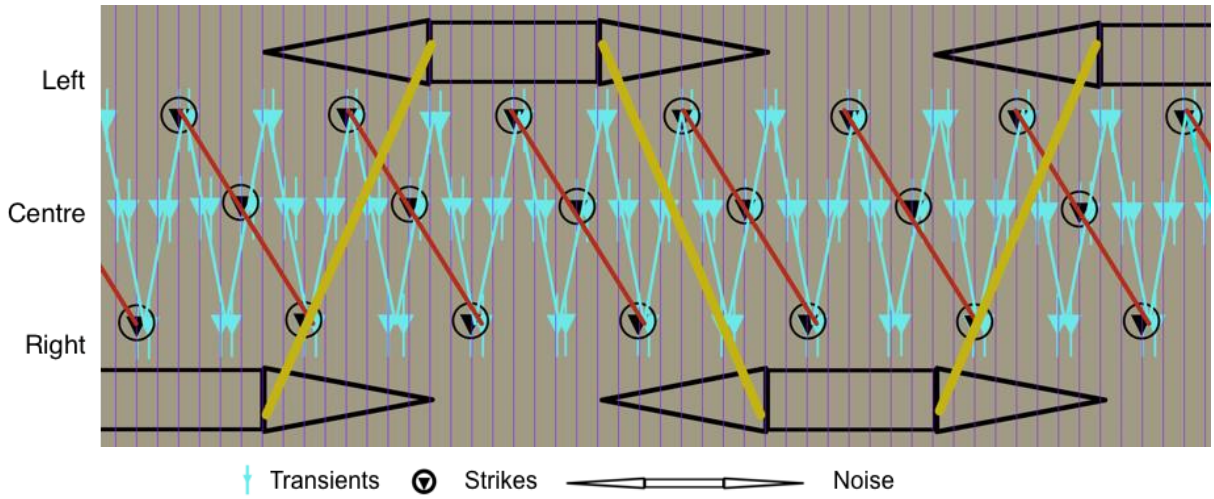

Figure 3.4: Spatial movement C of the noise layer (eAnalysis, event outline).

In the middle part of the track the spatial movement of the layers changes significantly. The sound is filtered in the high frequency range. This causes the transients to disappear. Because of this, the attention shifts away from the rhythm, creating the feeling of a break. The resonance layer now becomes the focus of attention. The resonance is placed in the center of the stereo image and stabilizes the general sound image. The movement of the panning pattern thereby takes a break. Additionally, the panning pattern of the strikes slows down. Changes of the position occur only every third strike and alternate between left, center, and right. This break part resembles the basic structure of a Techno track. A "buildup" part in the beginning is followed by a break section, which then usually leads to a progression and finally a slightly reduced part at the end.

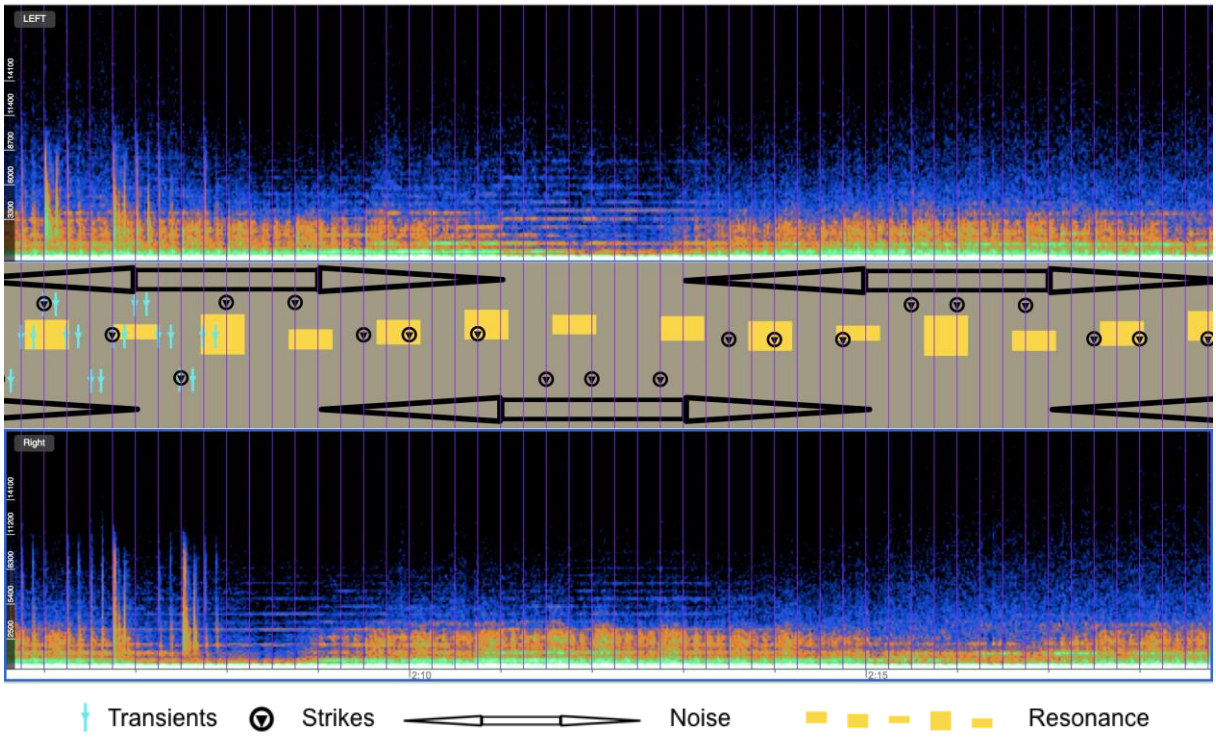

Figure 3.5: Spatial movement D, variation in the break, 2:05–2:20 (eAnalysis, linear).

The spatial movement in the composition creates panning patterns that enforce interaction between the sound layers. The shifting of the panning patterns is caused by the triplet movement in the strike layer. This creates tension throughout the looping structure of the composition and triggers a sense of activity. The experimental use of panning methods as well as the sound texture of the elements explore the borders of the genre Techno.

Conclusion

As shown in the analyses, the structures and sounds of Techno music can be divers and complex. Rhythmical variations of elements break the order of four-beat-per-bar loops, and the movement in the stereo field is used as an aspect of sound. On the other hand, fixed panning may prevent interactions between layers. Sonic divergence and nonlinearity create tension within the compositions.

The experimentation with new technology, advanced practices, as well as techniques achieve musicality. This can be understood as a feedback process: experimenting with sound triggers provides new impulses, inspiring the composer to react within a certain set of parameters.

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