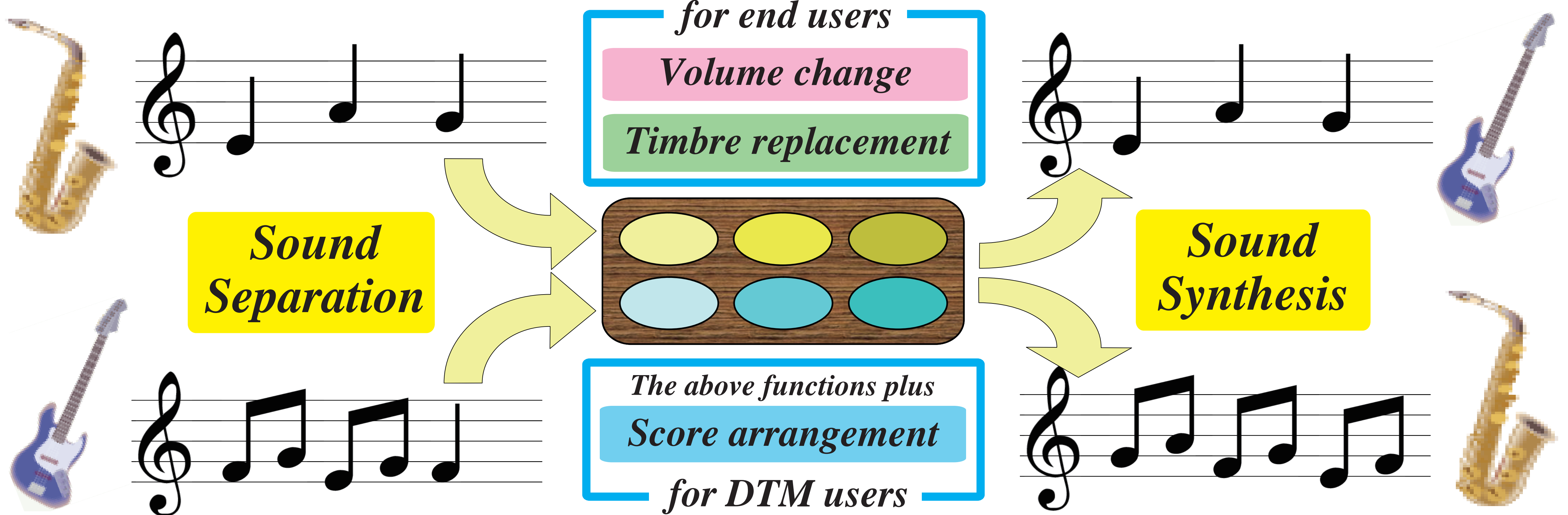# Sound Pallet: playing your favorite music with your favorite timbre

Takehiro Abe, Katsutoshi Itoyama, Kazuyoshi Yoshii[†], H. G. Okuno
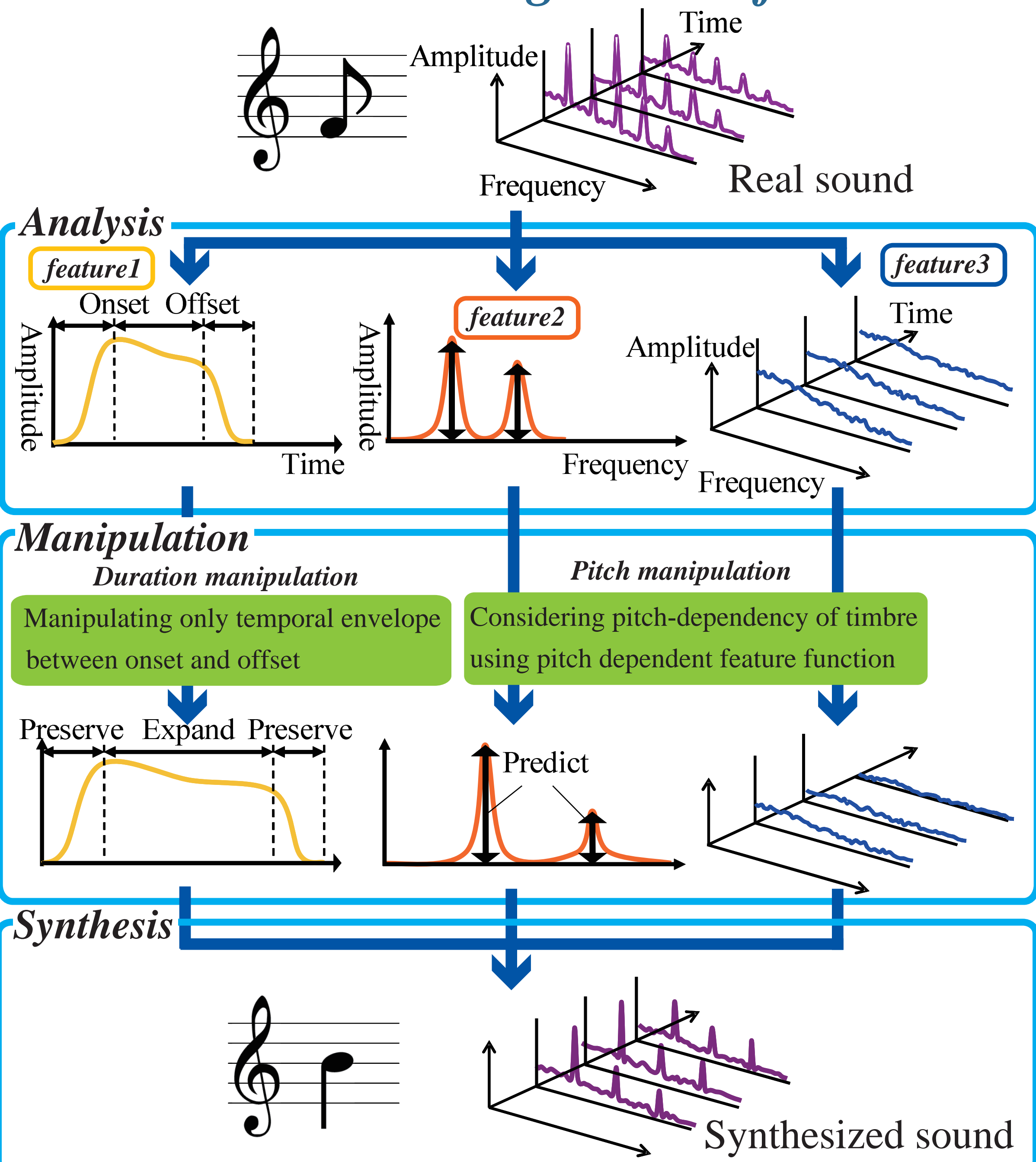**(Kyoto Univ.) (AIST[†])**

Overview/Our final goal

Concept of our study : *Playing your favorite music with your favorite* **volume** , **timbre** , **score** !

for end users

Volume change

Timbre replacement

Sound Separation

Sound Synthesis

The above functions plus

Score arrangement

for DTM users

Our final goal is to develop a musical instrument equalizer that can replace arbitrary musical instrument parts with users' favorite timbres (called *Sound Pallet*). *Sound Pallet* realizes timbre replacement by separating the monophonic sounds of a target musical instrument and synthesizing new sounds that have arbitrary pitch and duration from the separated sounds. *Sound Pallet* can manipulate pitch and duration of a musical instrument sound without distorting timbral characteristics by analyzing timbral features. Users can play their favorite music with their favorite timbre by using *Sound Pallet*.

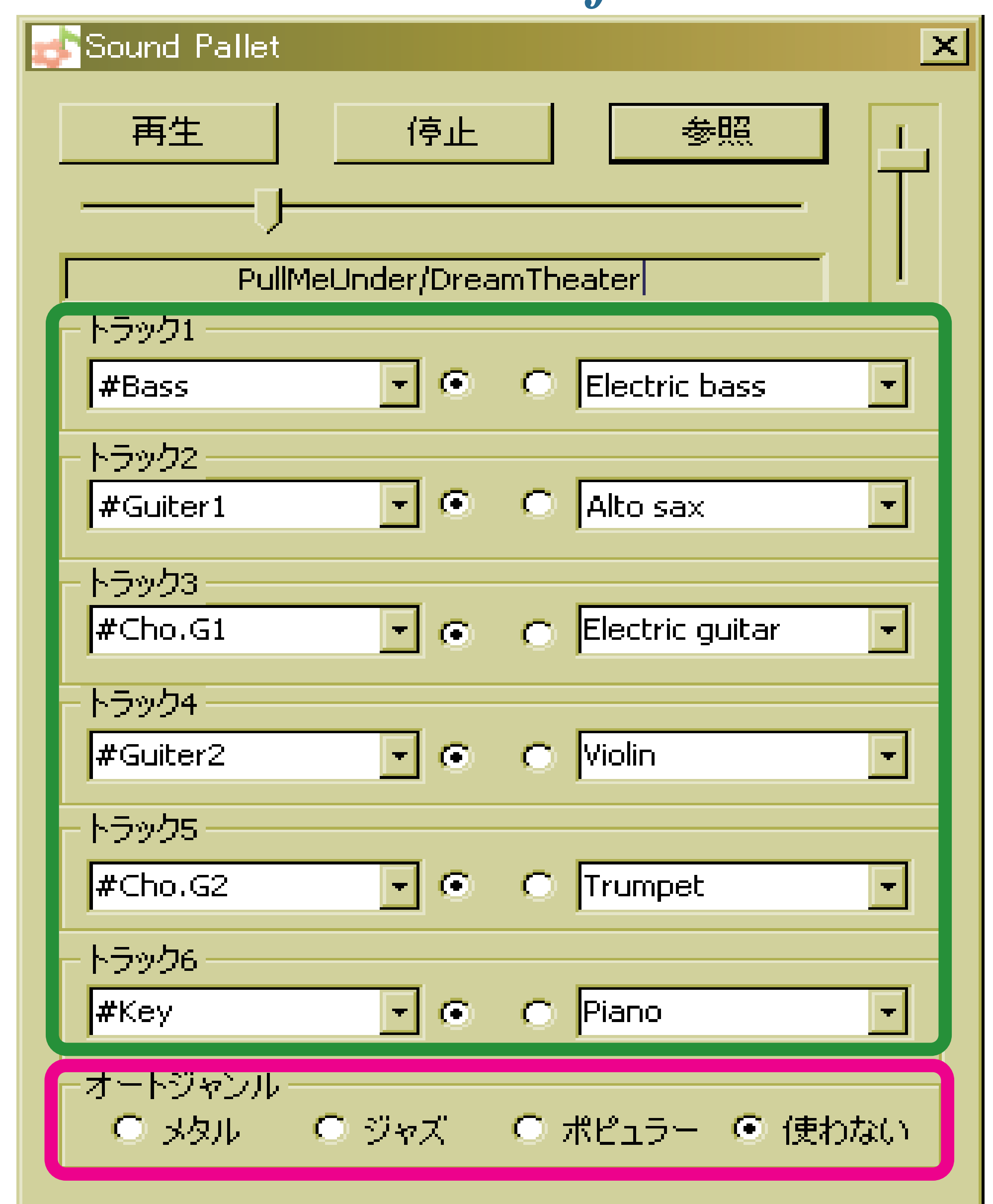## Manipulation of pitch and duration considering timbral features

Amplitude

Time

Frequency

Real sound

Analysis

feature1

feature2

feature3

Onset Offset

Amplitude

Time

Amplitude

Frequency

Amplitude

Time

Frequency

Manipulation

Duration manipulation

Manipulating only temporal envelope between onset and offset

Pitch manipulation

Considering pitch-dependency of timbre using pitch dependent feature function

Preserve Expand Preserve

Predict

Synthesis

Synthesized sound

We defined three timbral features:

feature1 : temporal envelopes,

feature2 : the relative amplitudes of the harmonic peaks, and

feature3 : the inharmonic component.

We consider these features not to distort timbral characteristics.

Trial interface

Sound Pallet

再生　　　　停止　　　　参照

PullMeUnder/DreamTheater

トラック1
#Bass　　　　　　Electric bass

トラック2
#Guiter1　　　　　Alto sax

トラック3
#Cho.G1　　　　　Electric guitar

トラック4
#Guiter2　　　　　Violin

トラック5
#Cho.G2　　　　　Trumpet

トラック6
#Key　　　　　　　Piano

オートジャンル
○ メタル　　○ ジャズ　　○ ポピュラー　　◉ 使わない

Trial interface equip the following funcitons:

1. timbre replacement function
User can replace timbres by selecting musical instruments from combo boxes.

2. auto genre select function
User can change the genre of music easily by pushing the radio bottoms.