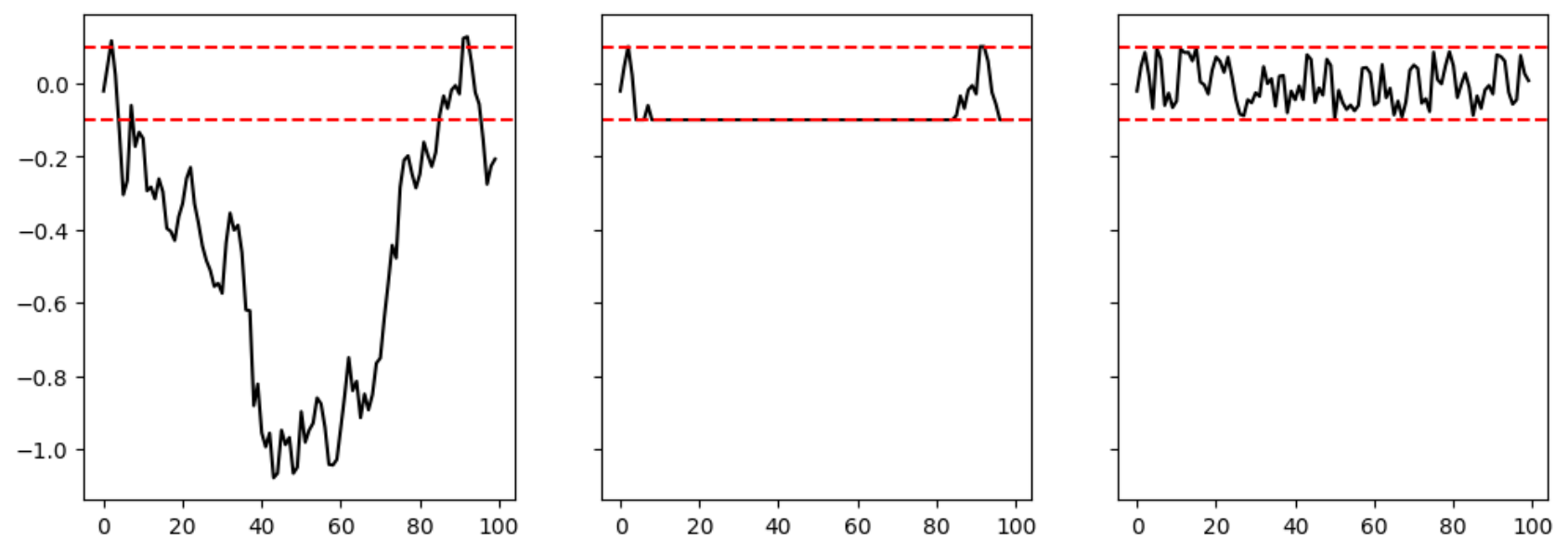


Kraštinių sąlygų įtaka savipanašiems procesams

12-toji jaunųjų mokslininkų konferencija 2024

Danielius Kundrotas,
vadovas dr. Rytis Kazakevičius

Vilniaus Universitetas fizikos fakultetas

danielius.kundrotas@ff.stud.vu.lt https://github.com/DamaKubu/

Turinys

- Stochastiniai procesai

Turinys

- Stochastiniai procesai
- Savipanašumas

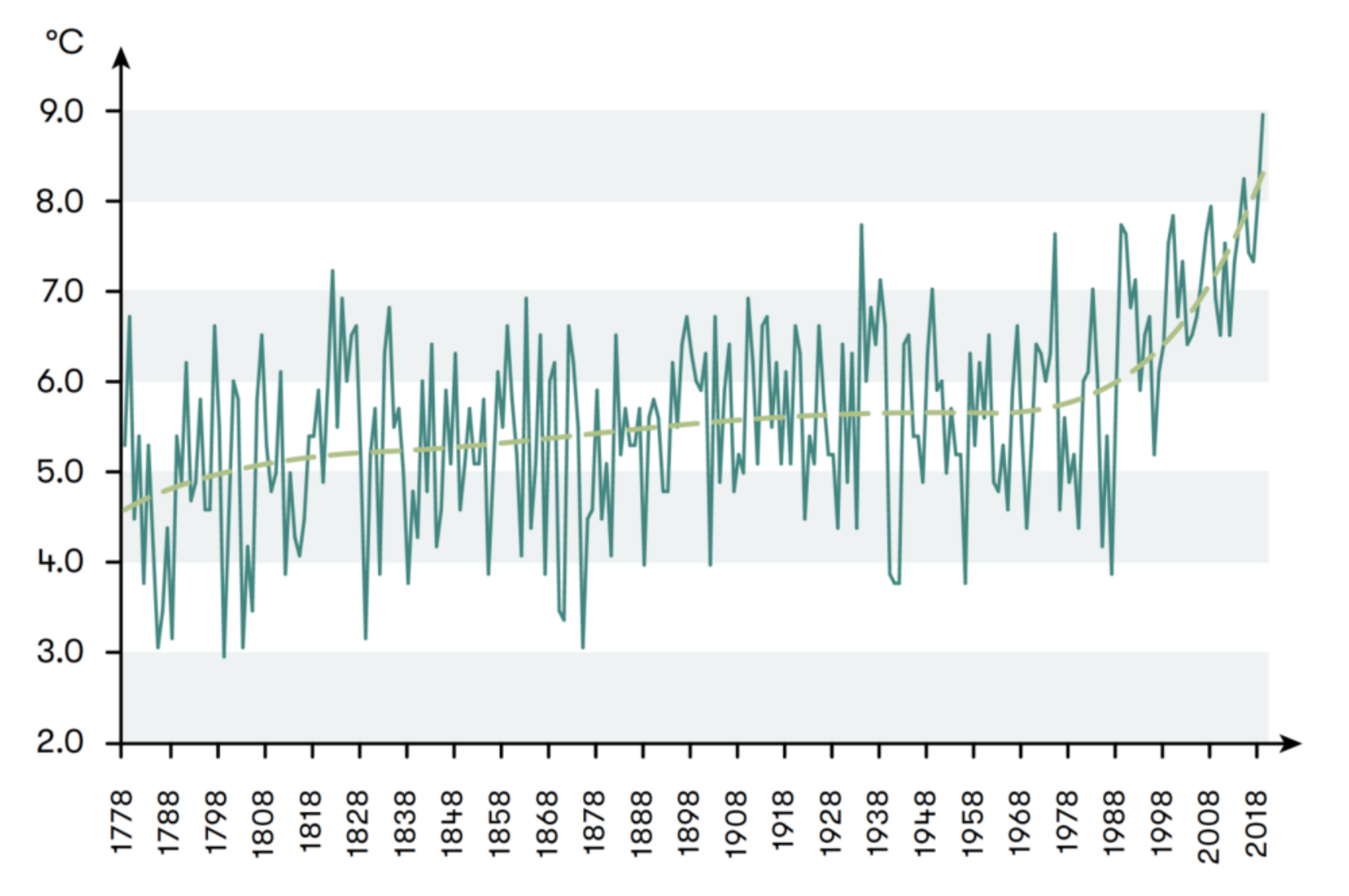
Turinys

- Stochastiniai procesai
- Savipanašumas
- Kraštinės sąlygos

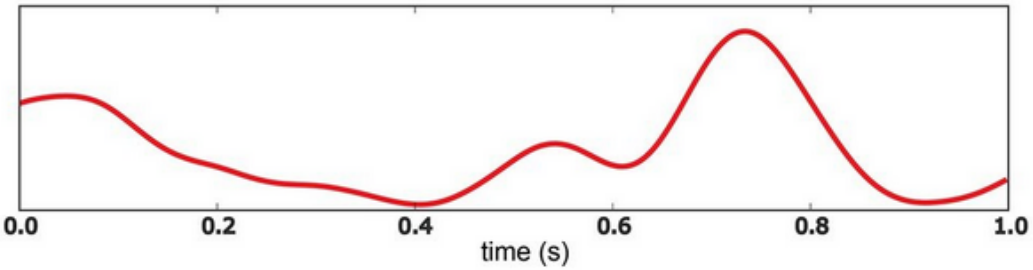
Turinys

- Stochastiniai procesai
- Savipanašumas
- Kraštinės sąlygos
- Rezultatai

Temperatūra

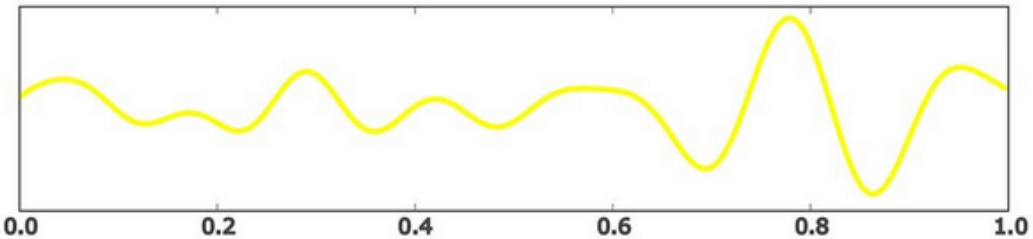


Smegenys



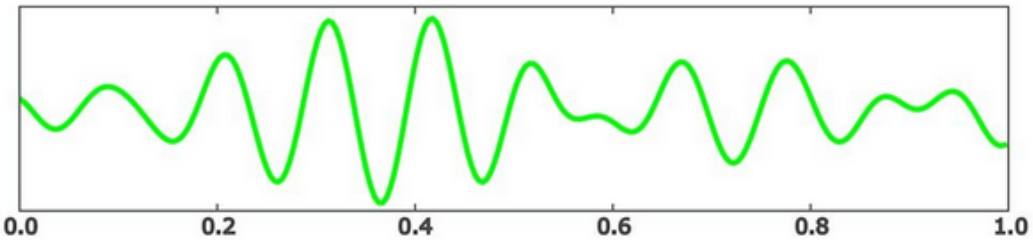
Delta Waves: 0 - 4 Hz

Delta waves tend to be the highest amplitude and slowest waves. It is seen normally in adults in slow-wave sleep. It is also seen normally in babies.



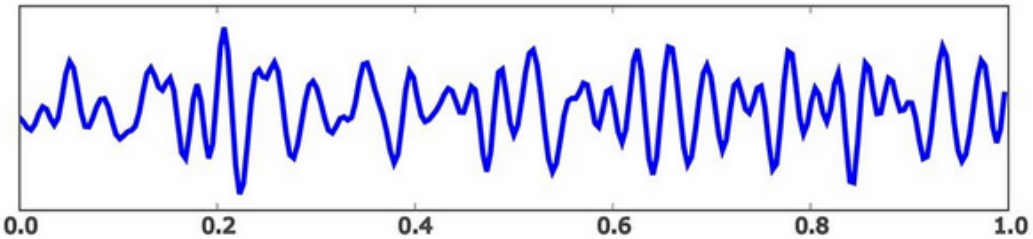
Theta Waves: 4 - 7 Hz

Theta waves are normally seen in young children, but theta waves can also be observed during meditation and are associated with relaxed creative states.



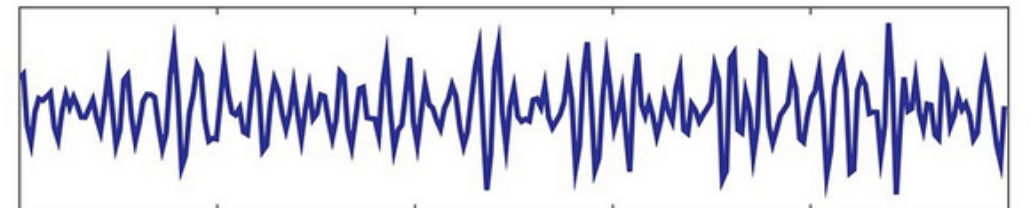
Alpha Waves: 7 - 13 Hz

Alpha waves are the dominant rhythm of the posterior regions of the brain. It emerges during relaxation, and attenuates during mental stimulation.



Beta Waves: 14 - 30 Hz

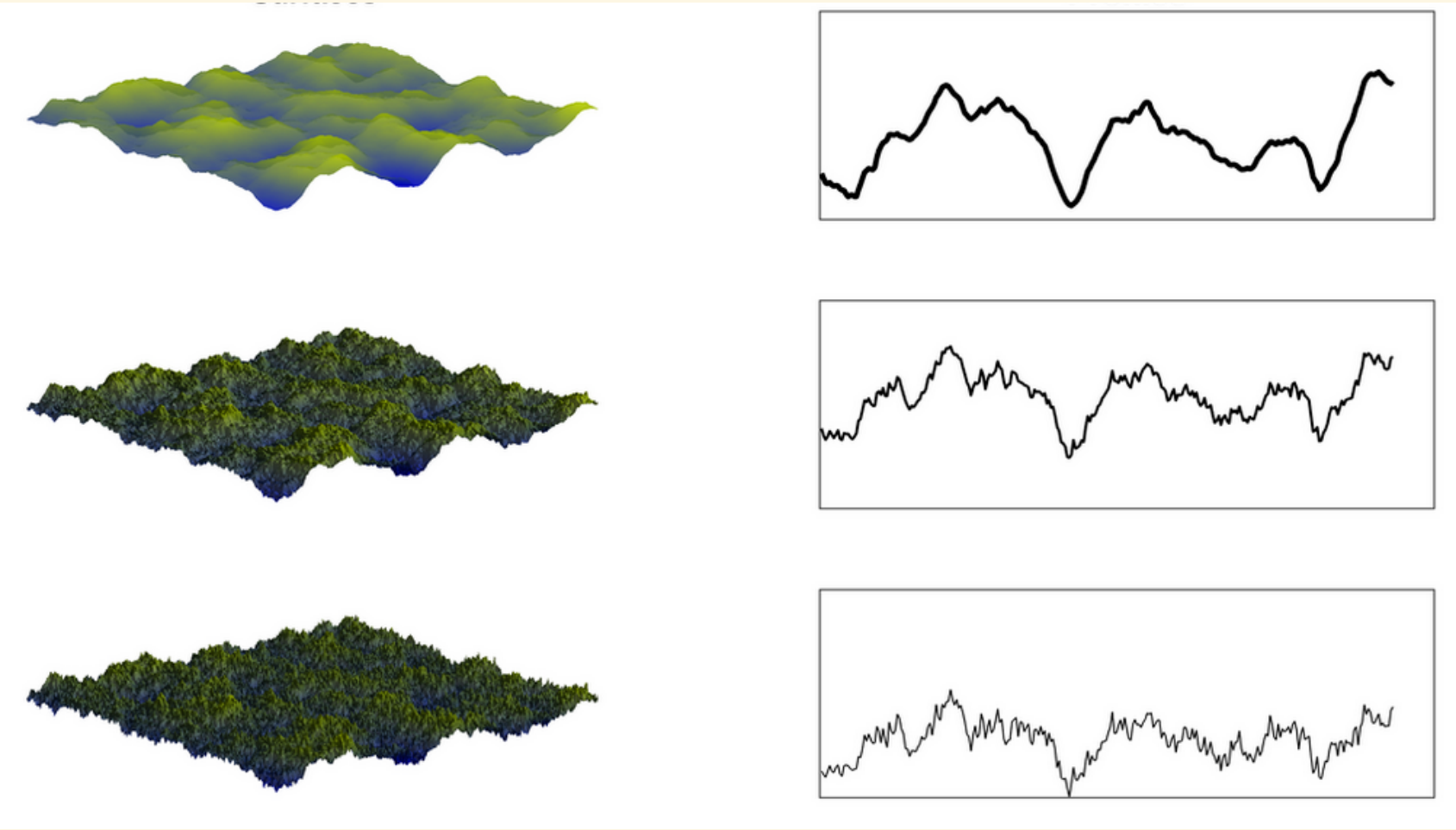
Beta waves are located frontally and is the dominant rhythm associated with alertness, active concentration, and also anxious thinking.



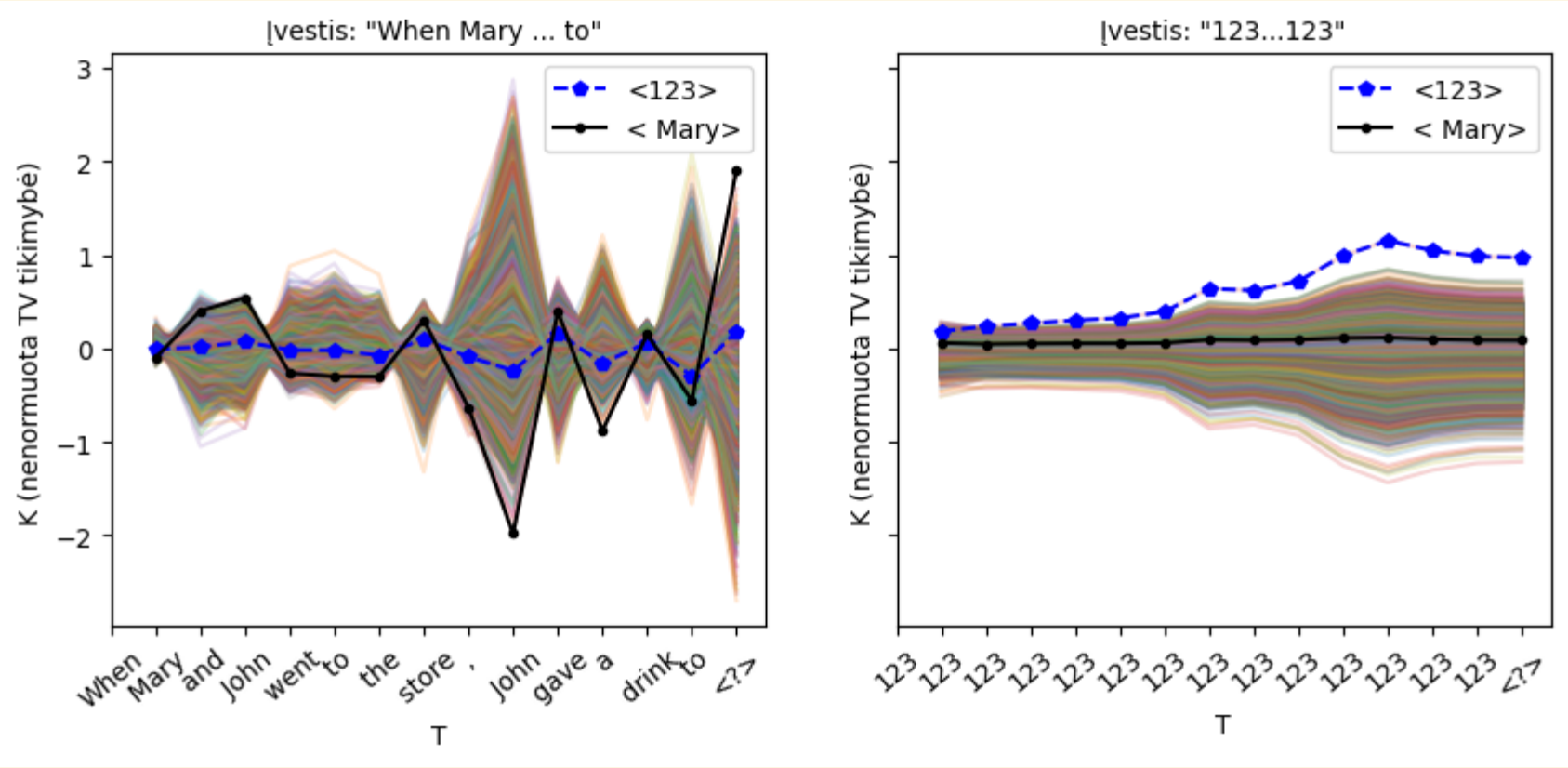
Gamma Waves: 30 - 100 Hz

Gamma rhythms bind groups of neurons together into larger networks to carry out specific tasks. Observed strongly with master meditators.

Paviršiaus grubumas

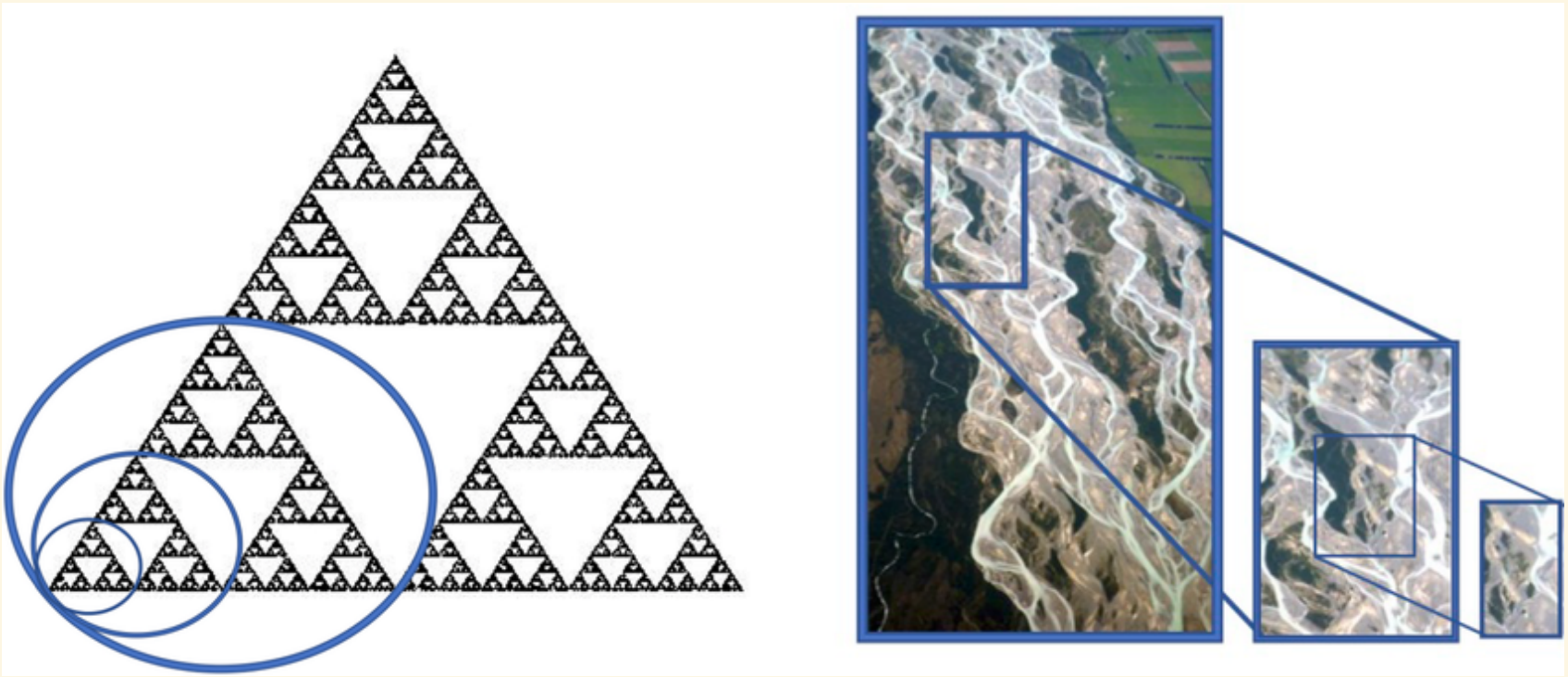


LLM


Įvestis: "When Mary ... to"
<123>
< Mary>
K (nenormuota TV tikimybė)
3
2
1
0
−1
−2
When
Mary
and
John
went
to
the
store
,
John
gave
a
drink
to
<?>
T
Įvestis: "123...123"
<123>
< Mary>
K (nenormuota TV tikimybė)
123
<?>
T

Savipanašumas

$$N = s^D \tag{1}$$



Savipanašumas FBM

$$X_H(at) \sim |a|^H X_H(t) \tag{2}$$

Savipanašumas FBM

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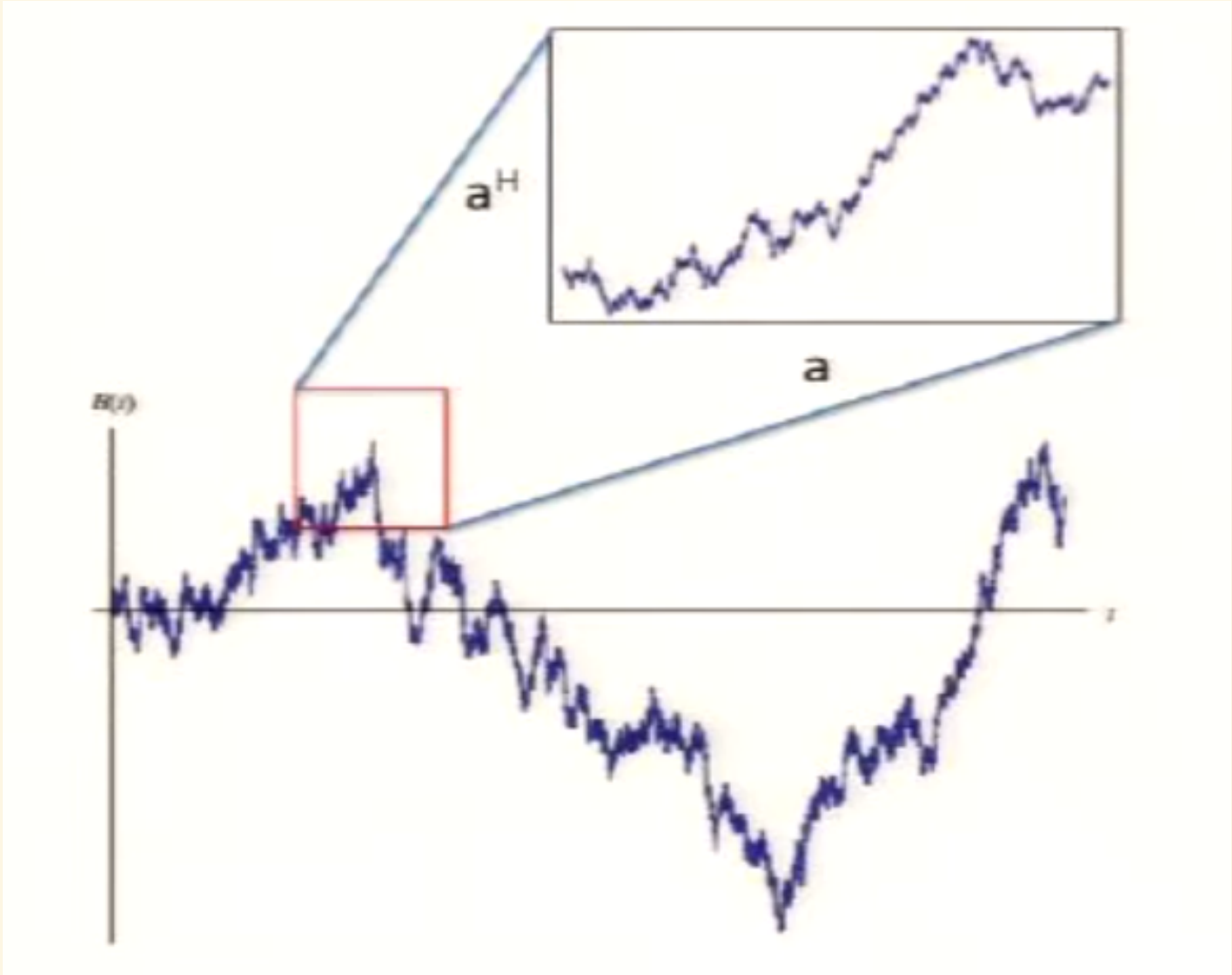
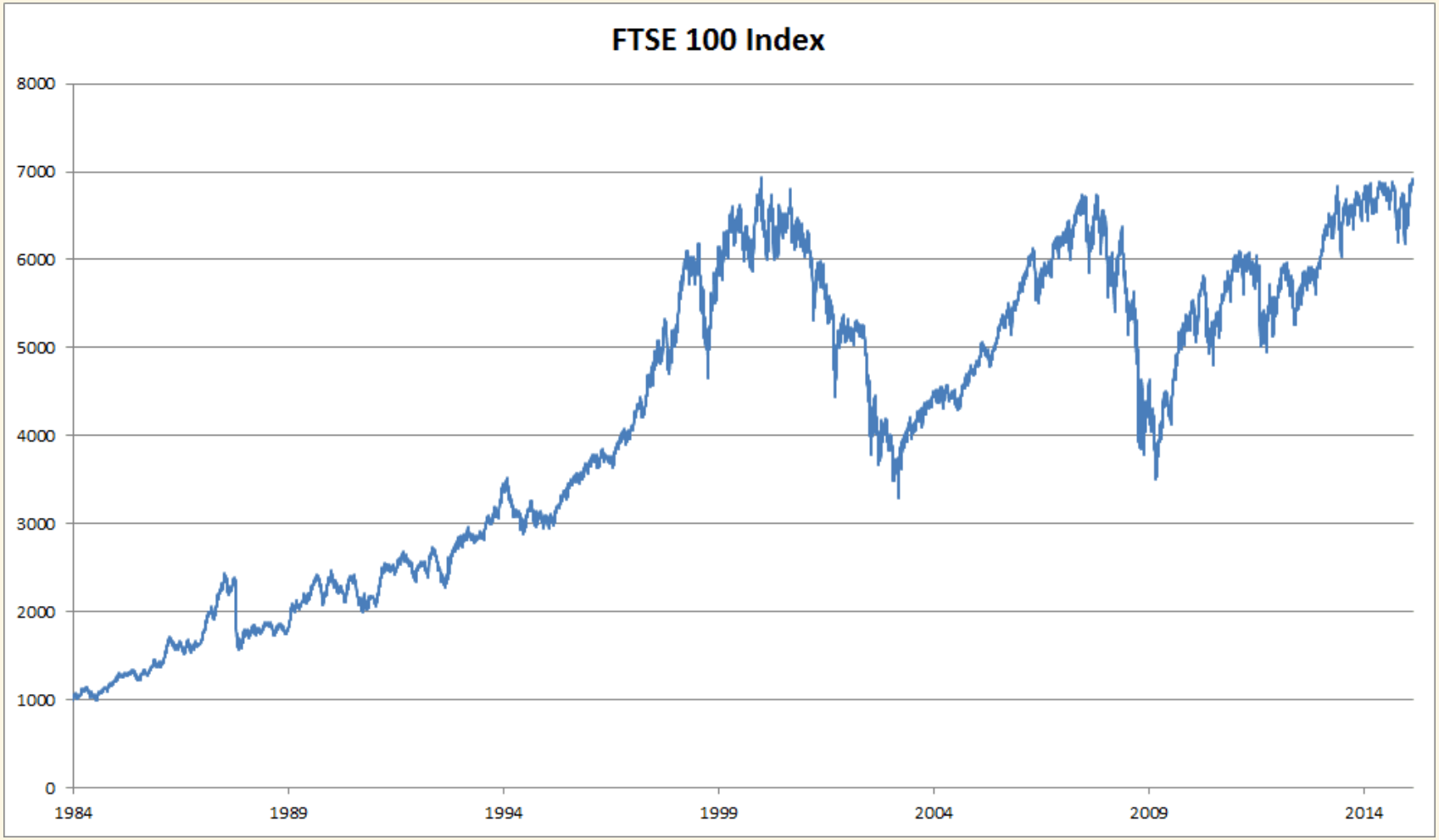
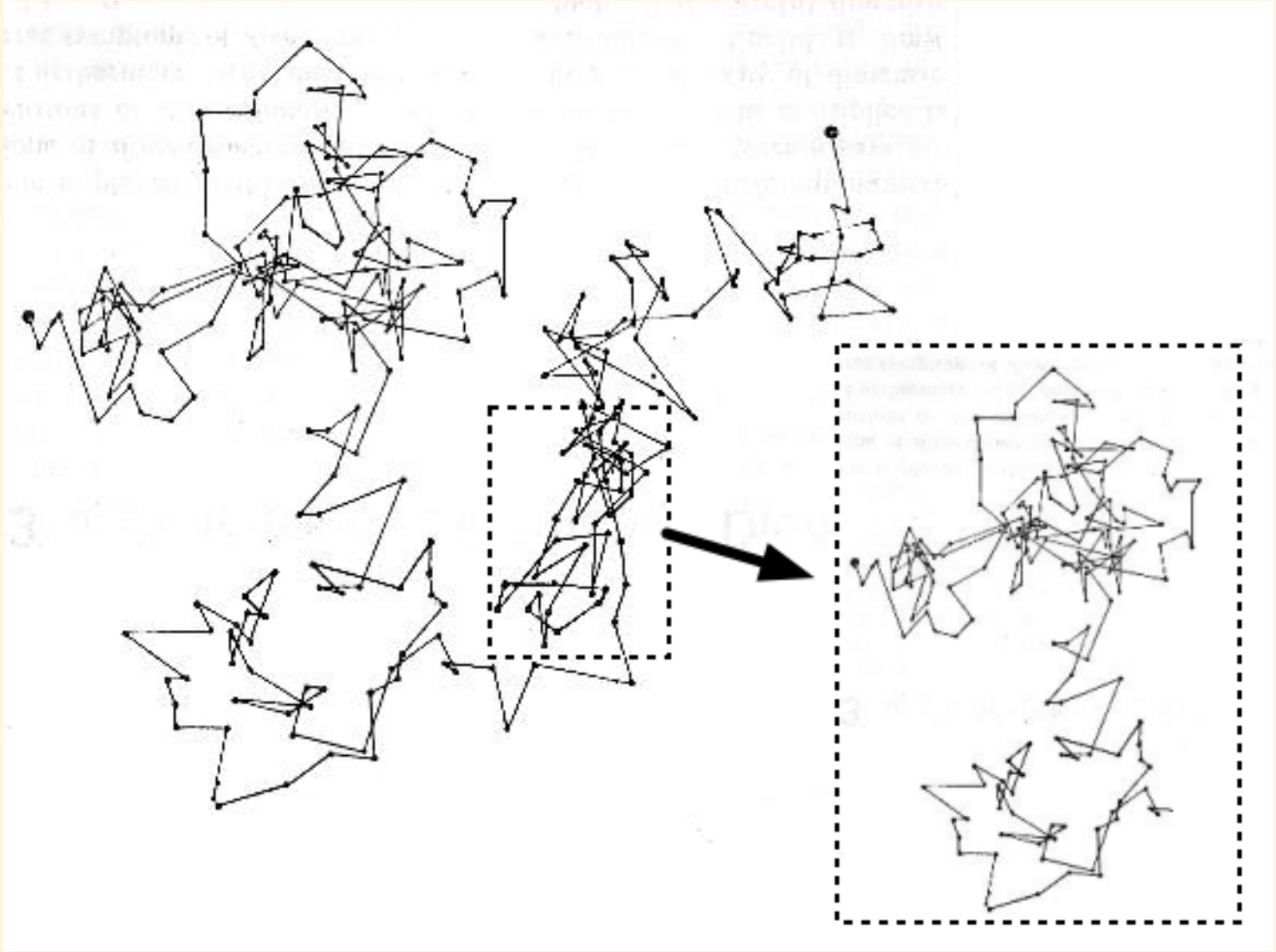


Akcijos

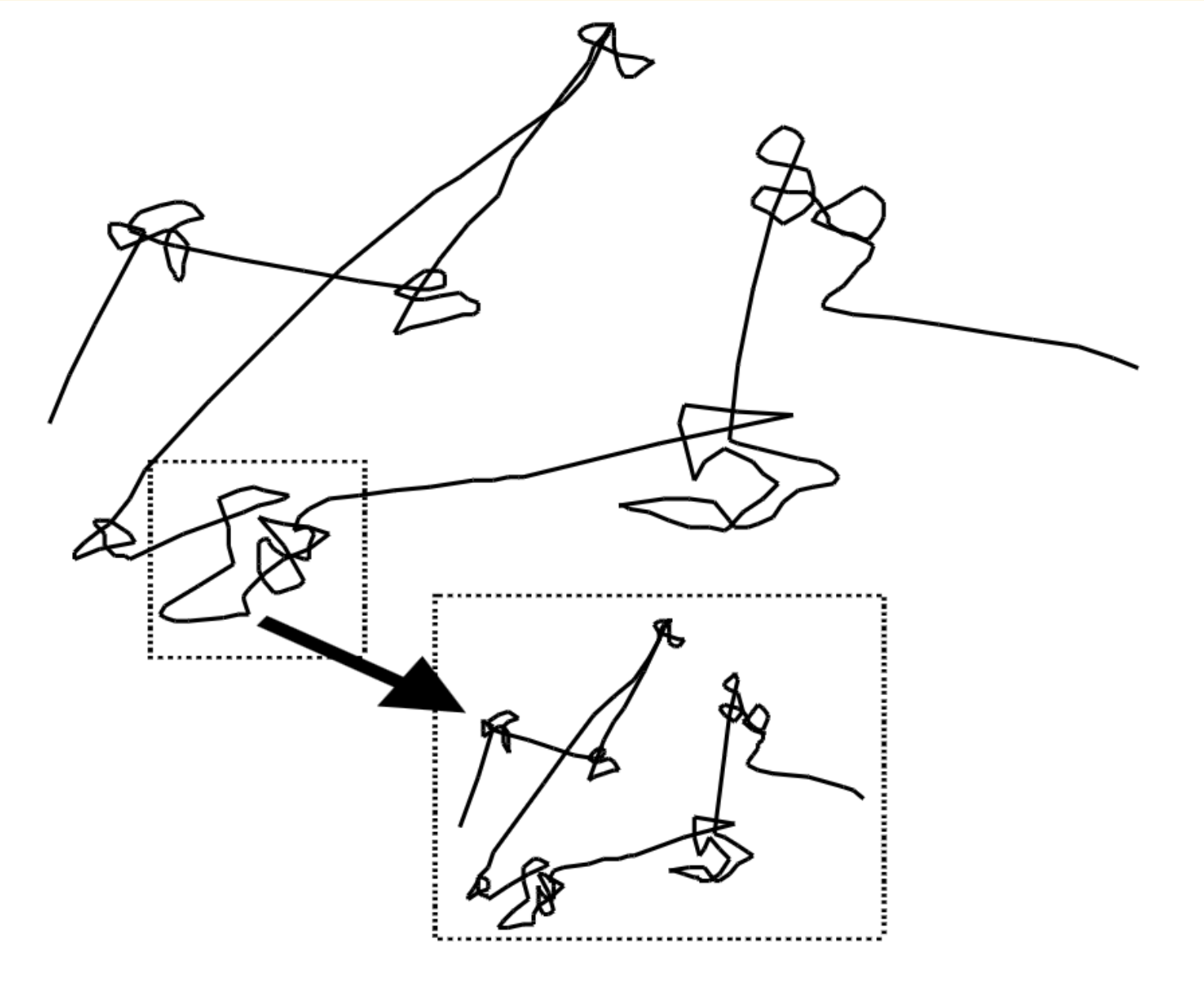

FTSE 100 Index
8000
7000
6000
5000
4000
3000
2000
1000
0
1984
1989
1994
1999
2004
2009
2014

Kalnai

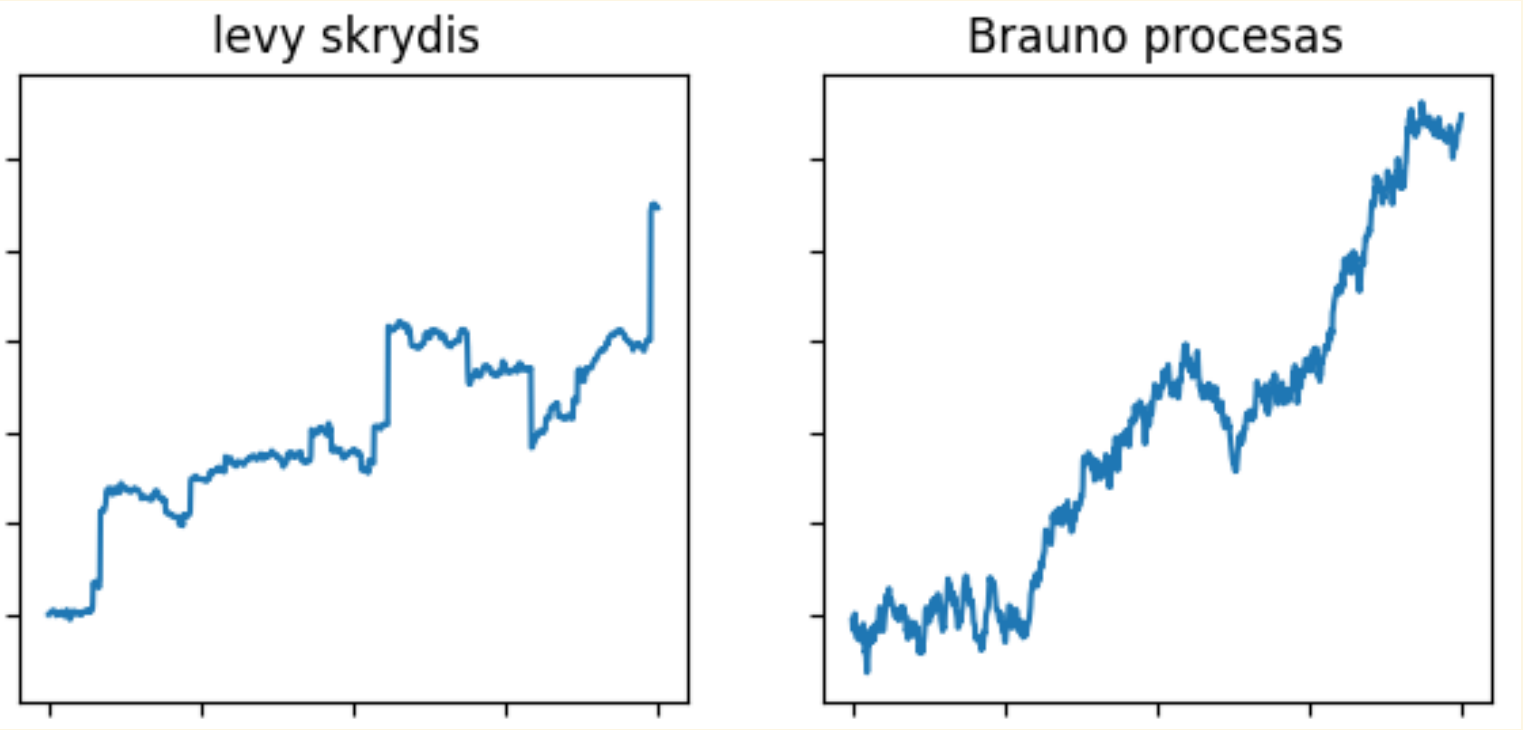
FBM



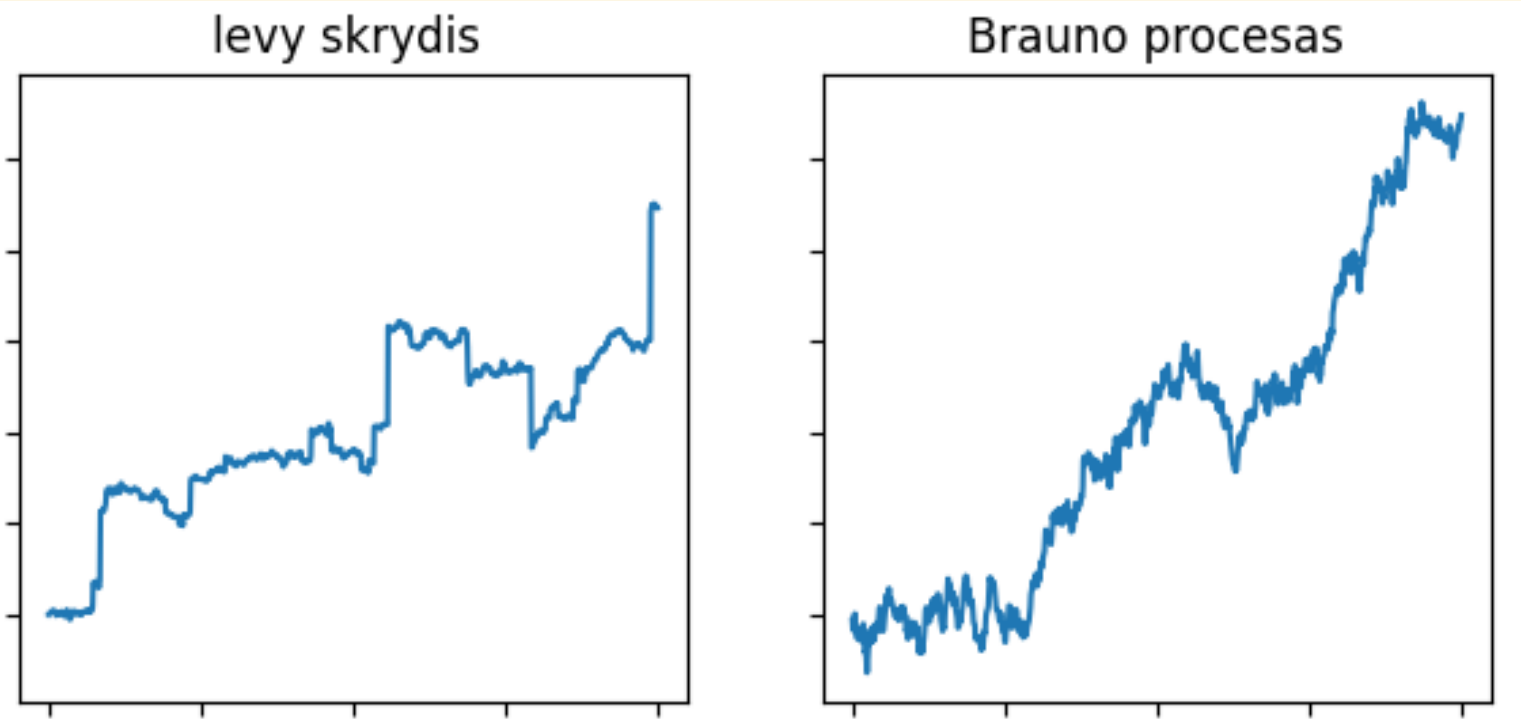
levy skrydis

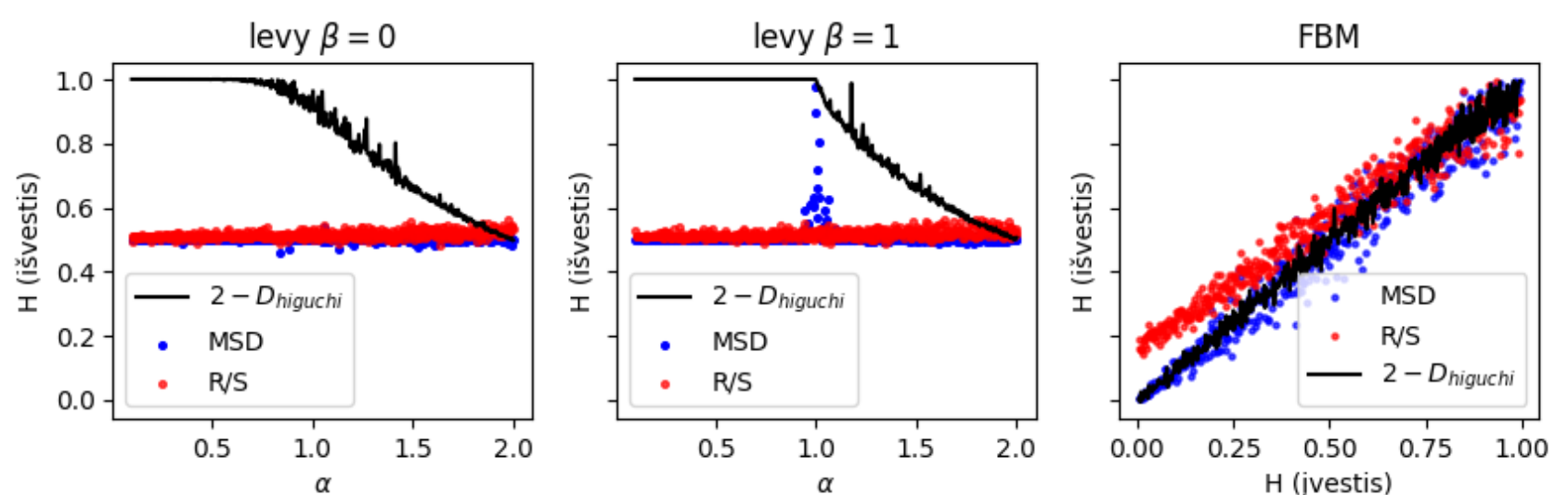


Levy prieš FBM



Levy prieš FBM





Metodas

1. Generuojame savipanašius procesus

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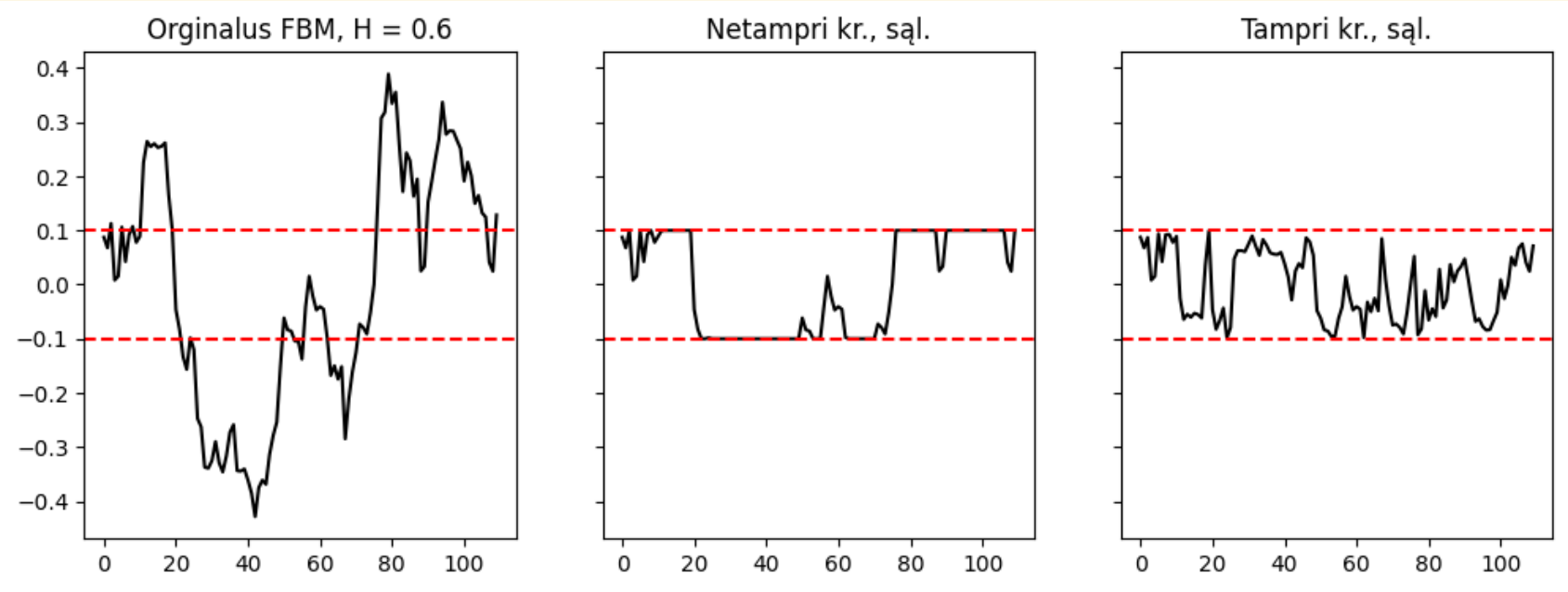
2. Taikome kraštines sąlygas

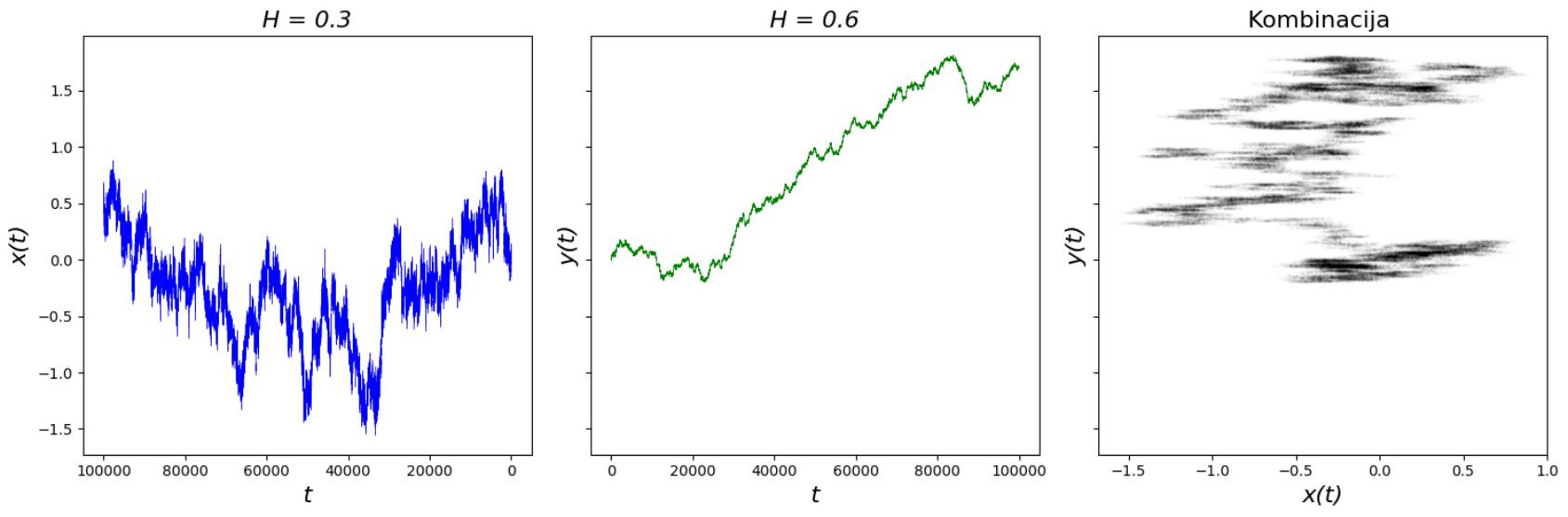
Metodas

1. Generuojame savipanašius procesus
2. Taikome kraštines sąlygas
3. Analizuojame

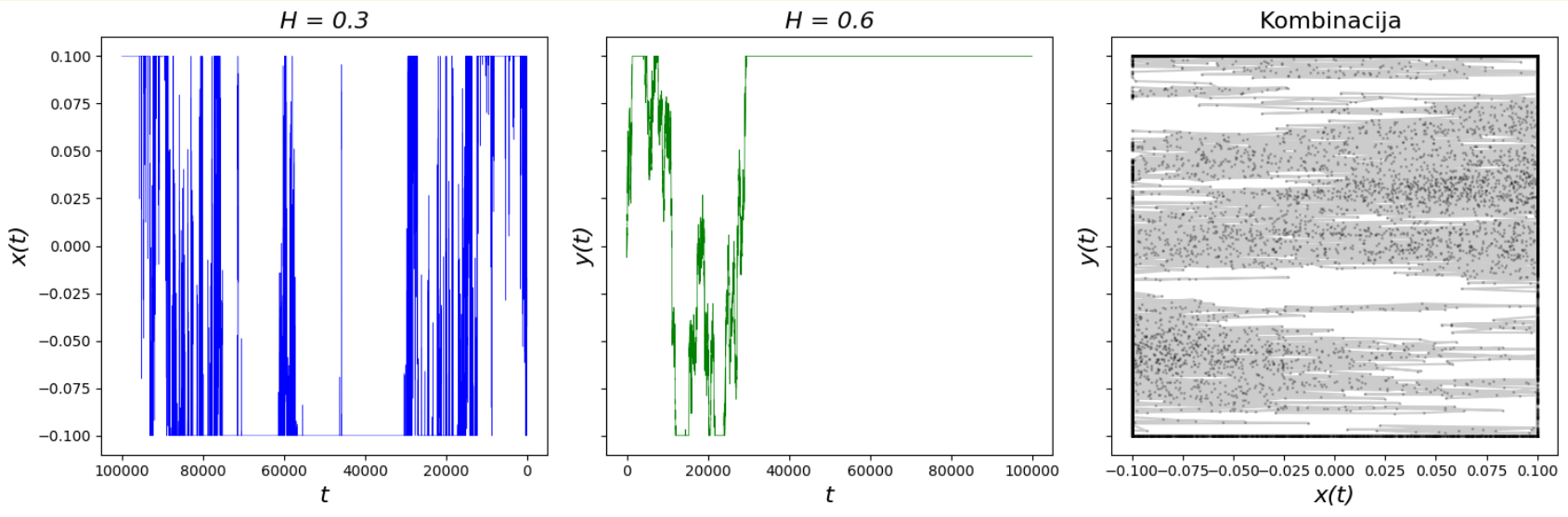
Kraštinės sąlygos



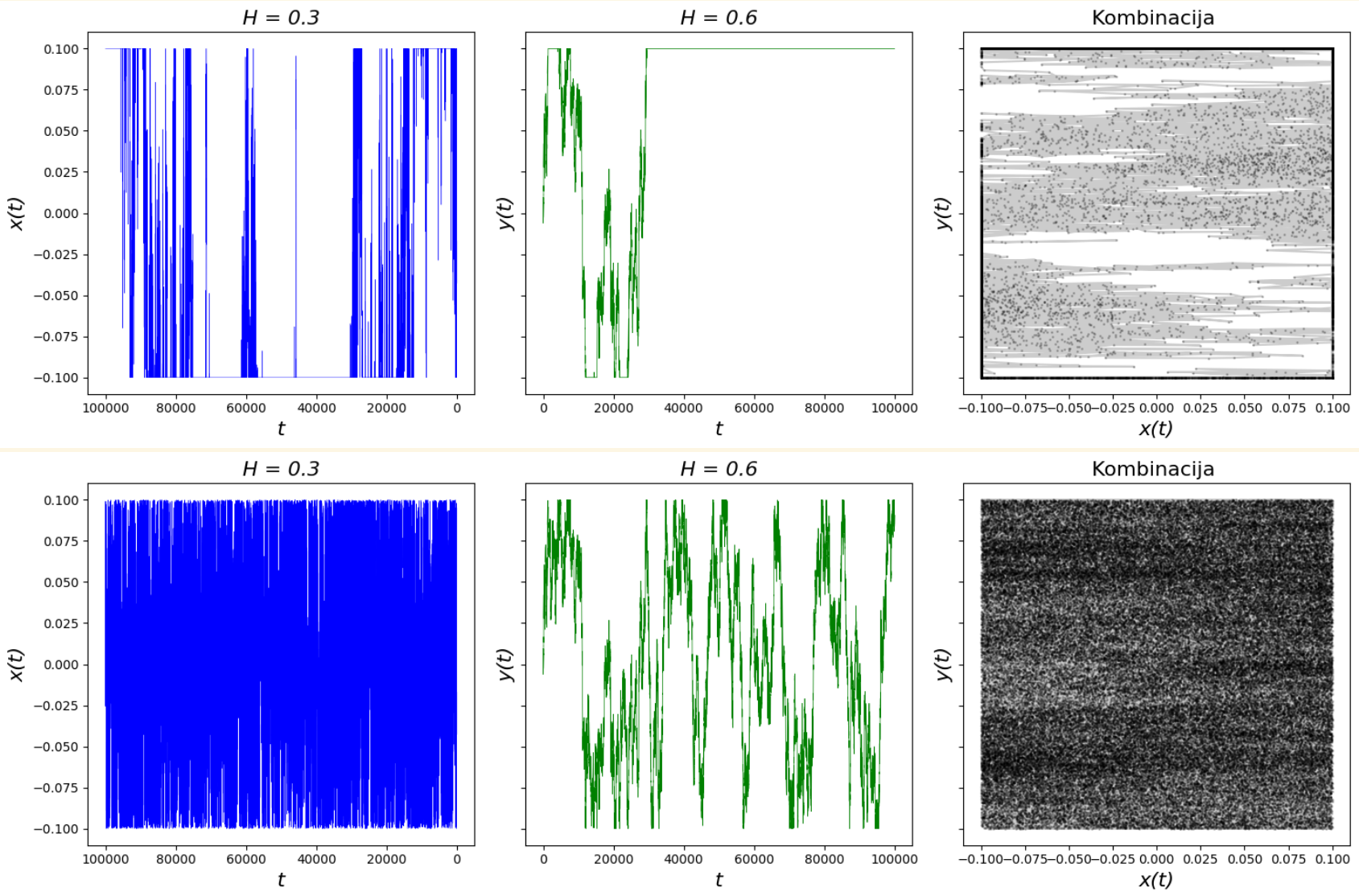
FBM dėžėje



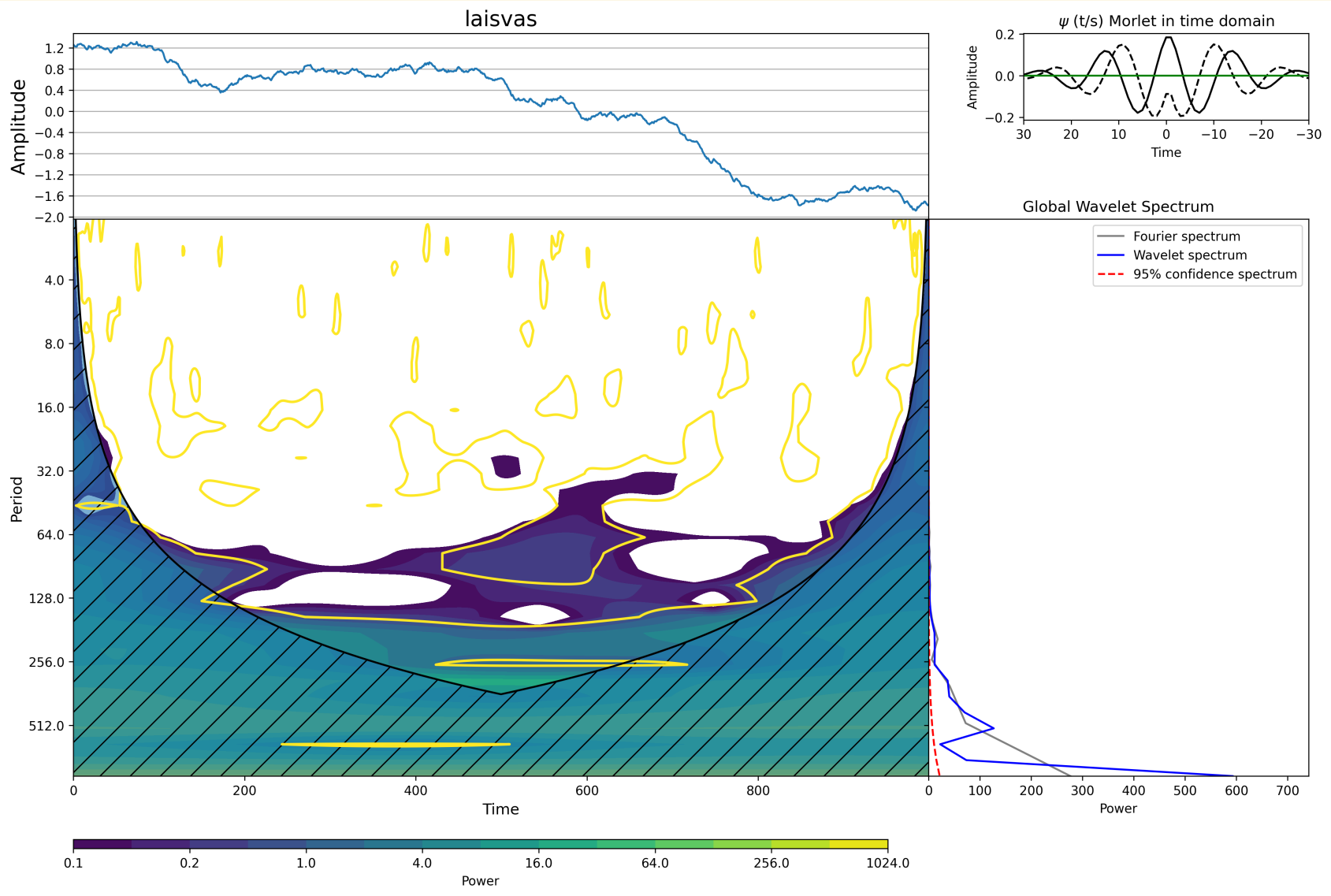
FBM dėžėje



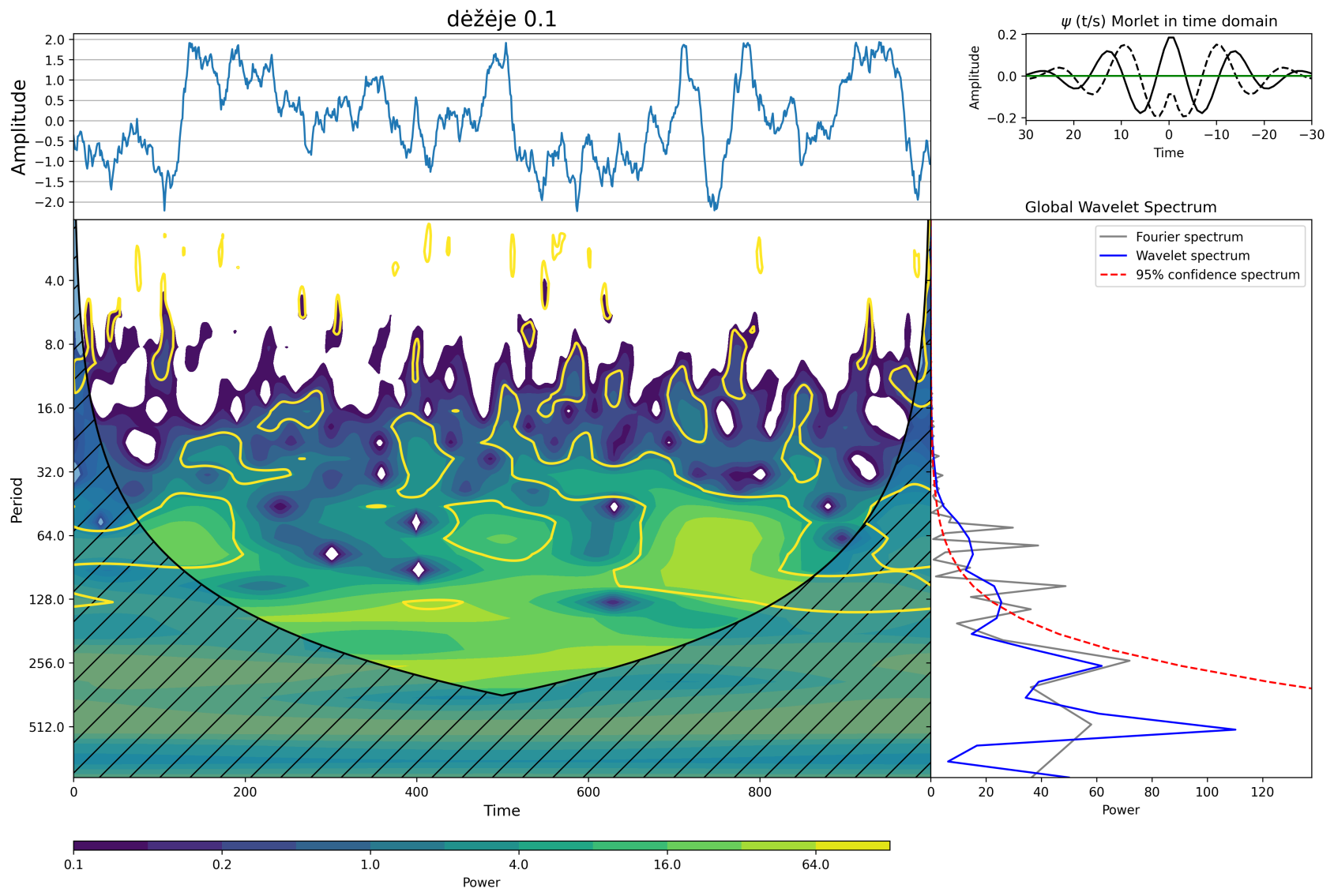
FBM dėžėje


H = 0.3
H = 0.6
Kombinacija
x(t)
y(t)
t
x(t)
0.100
0.075
0.050
0.025
0.000
−0.025
−0.050
−0.075
−0.100
100000
80000
60000
40000
20000
0
−0.100 −0.075 −0.050 −0.025 0.000 0.025 0.050 0.075 0.100

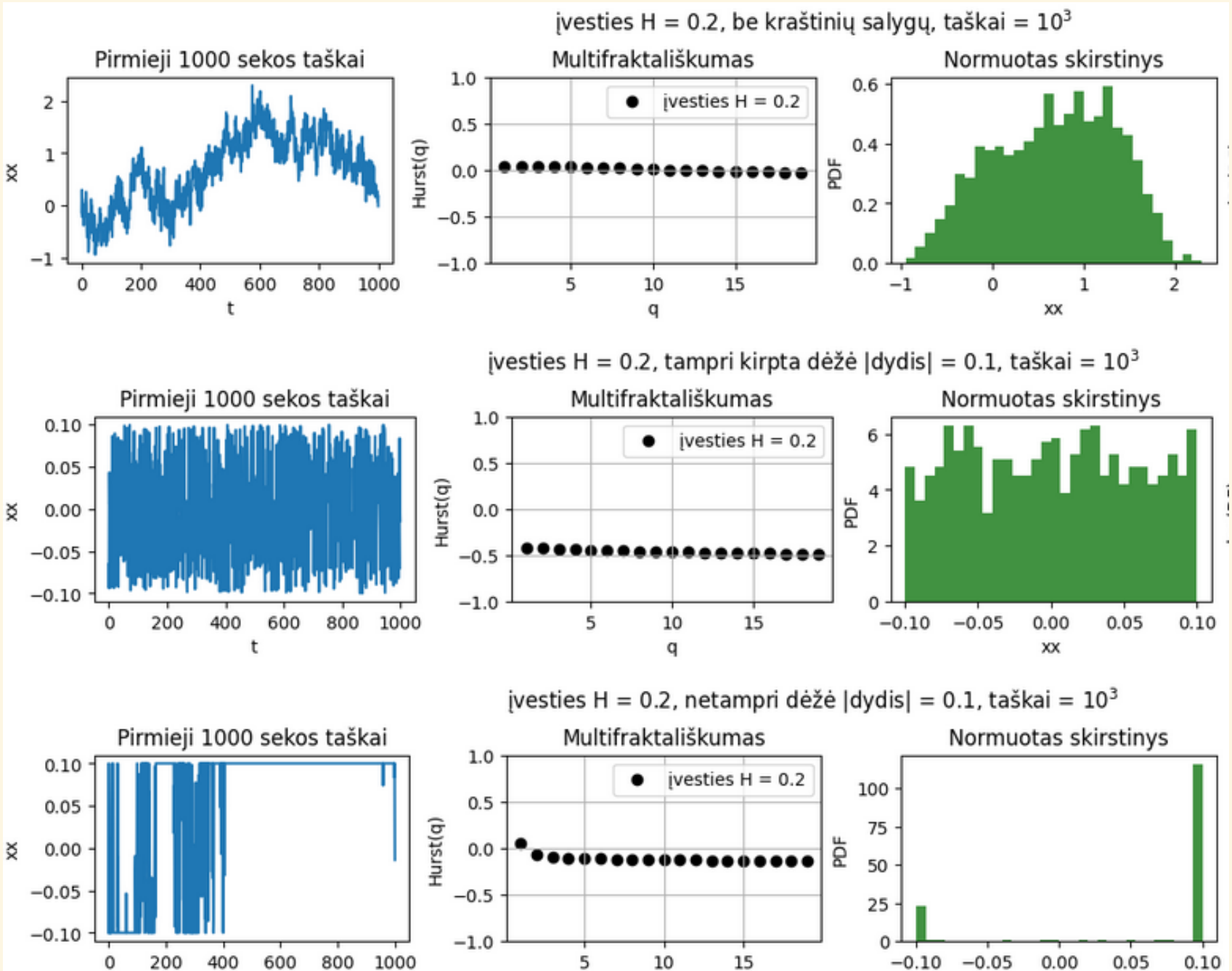
Banginė analizė



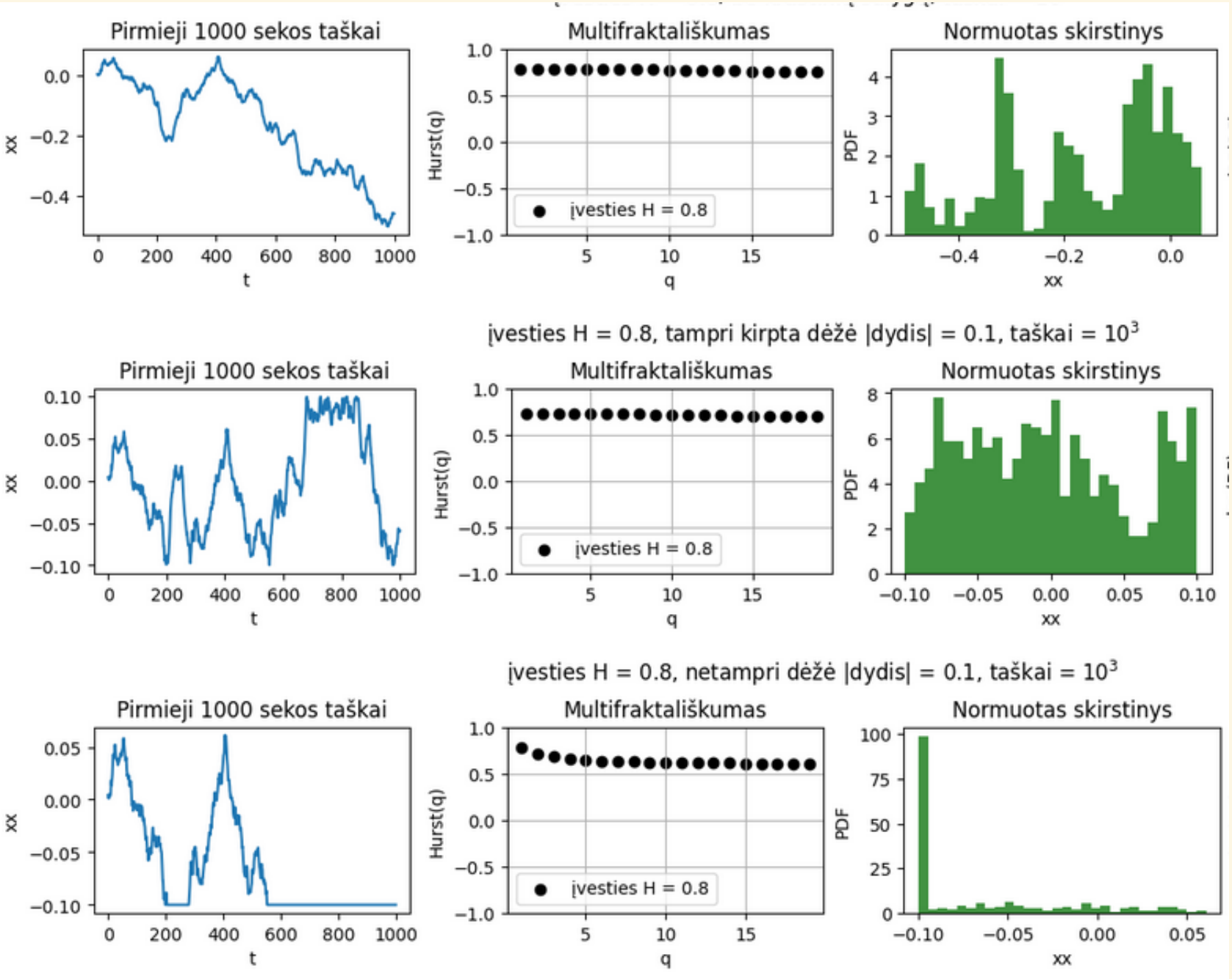
Kas atsitinka dėžėje?



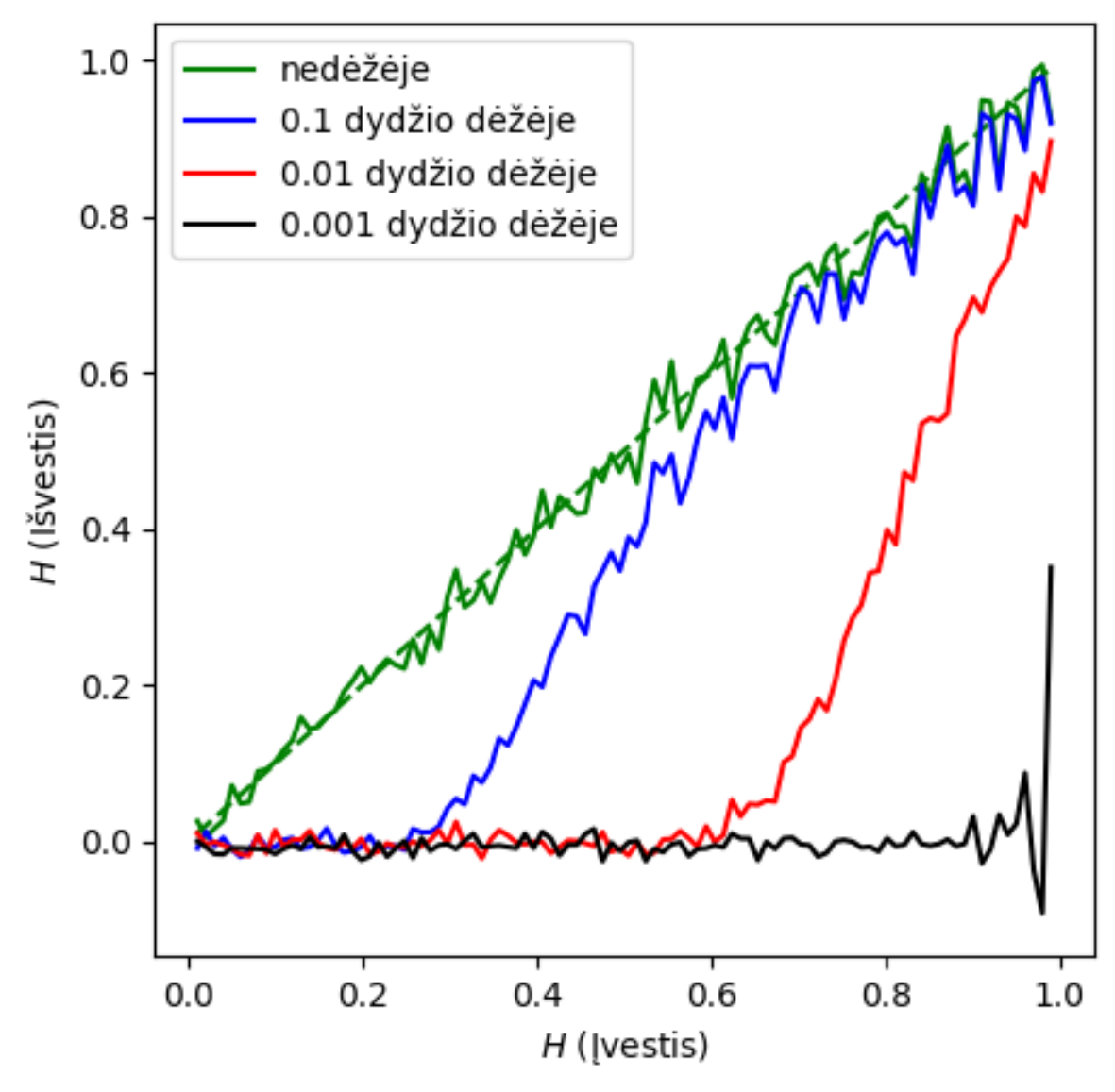
Netampri dėžė FBM $H = 0.2$



Netampri dėžė FBM $H = 0.8$



Tampri dėžė FBM



Kur čia fizika? Anomali difuzija

„Labai norėčiau, jog užtektų vieno parametro, kuris paaiškintų anomalią difuziją, tokio tiesiog nėra.“

Rytis Kazakevičius 2024