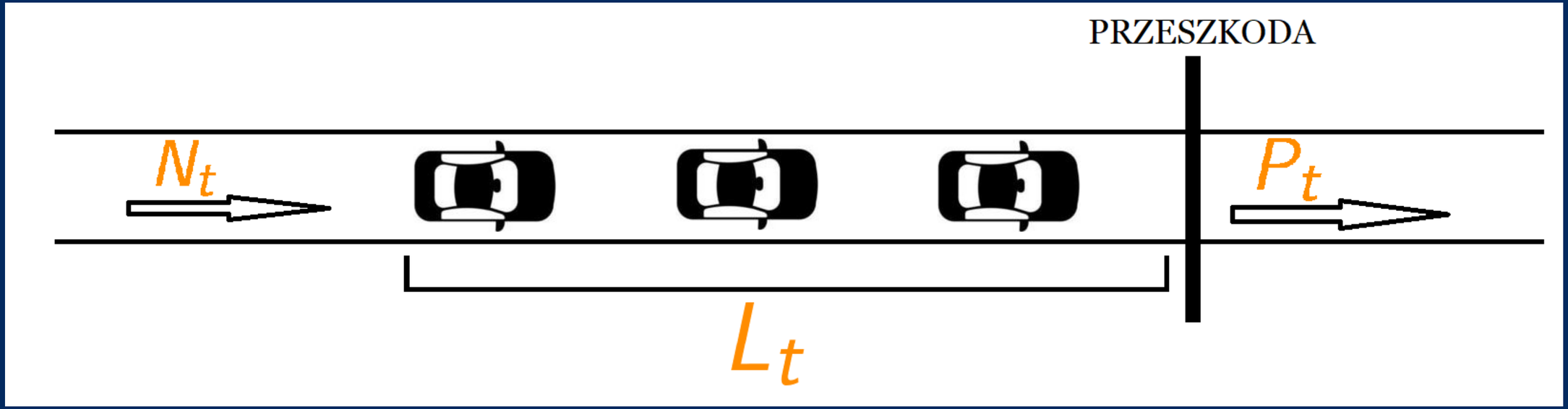
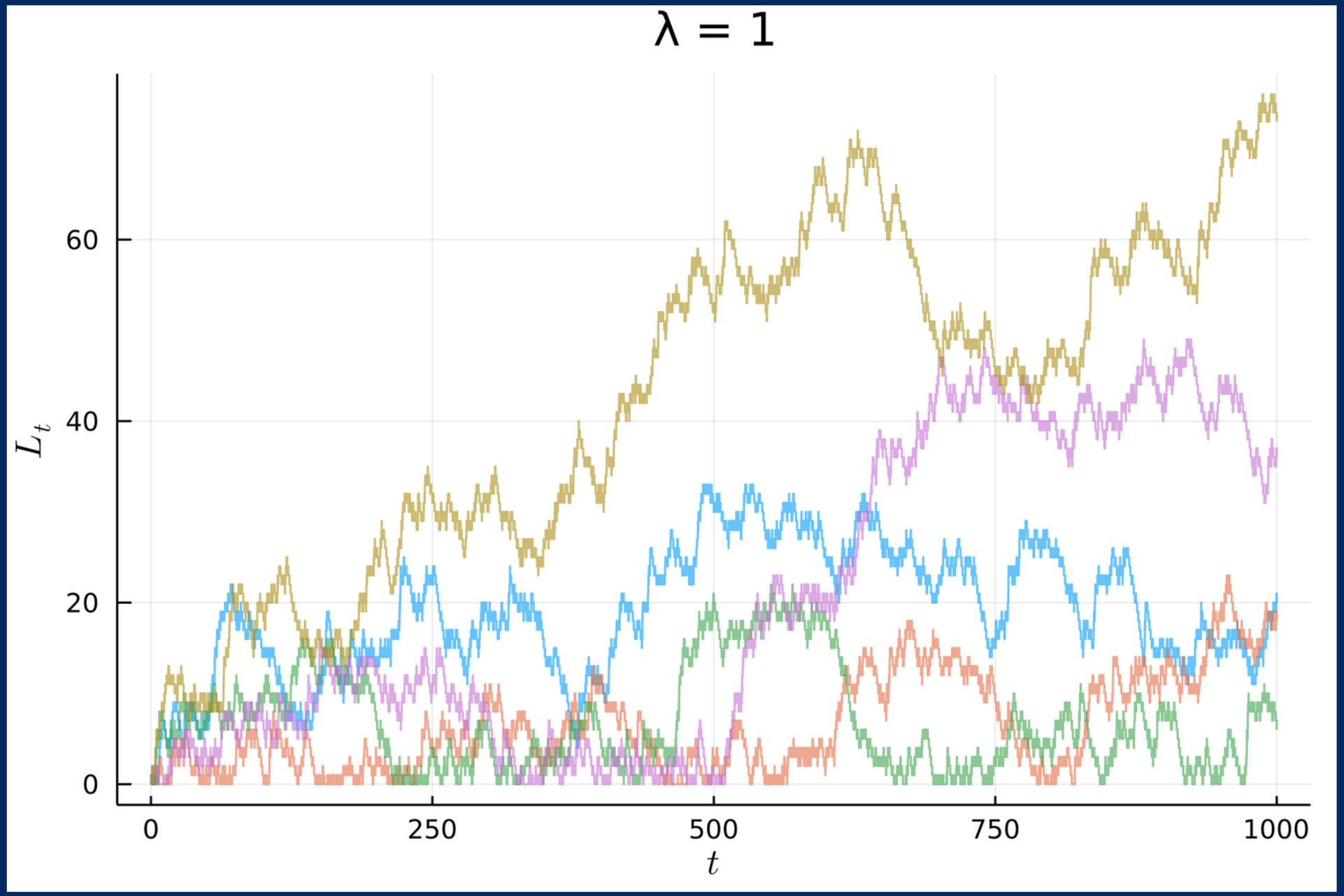
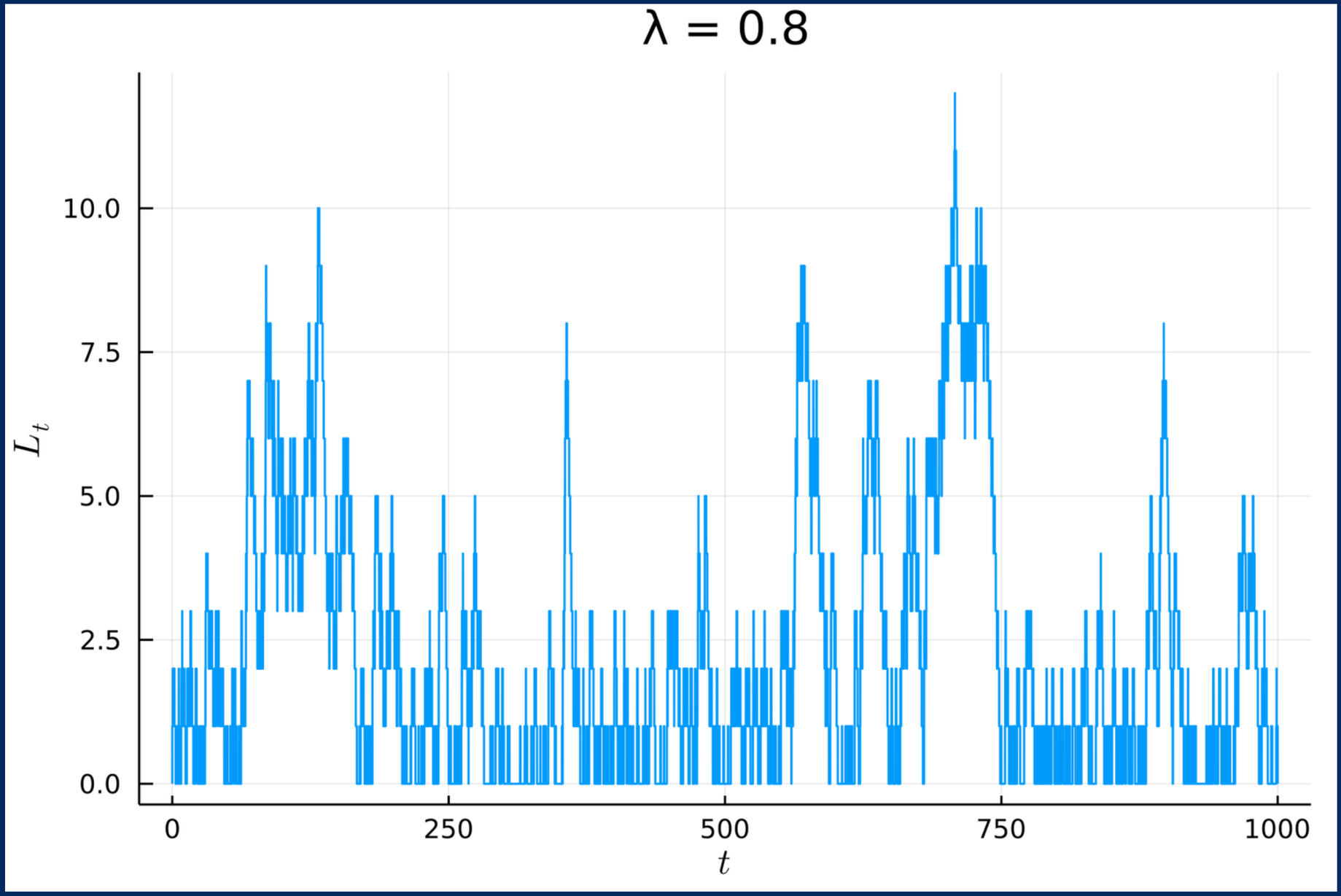
MODELOWANIE RUCHU ULICZNEGO

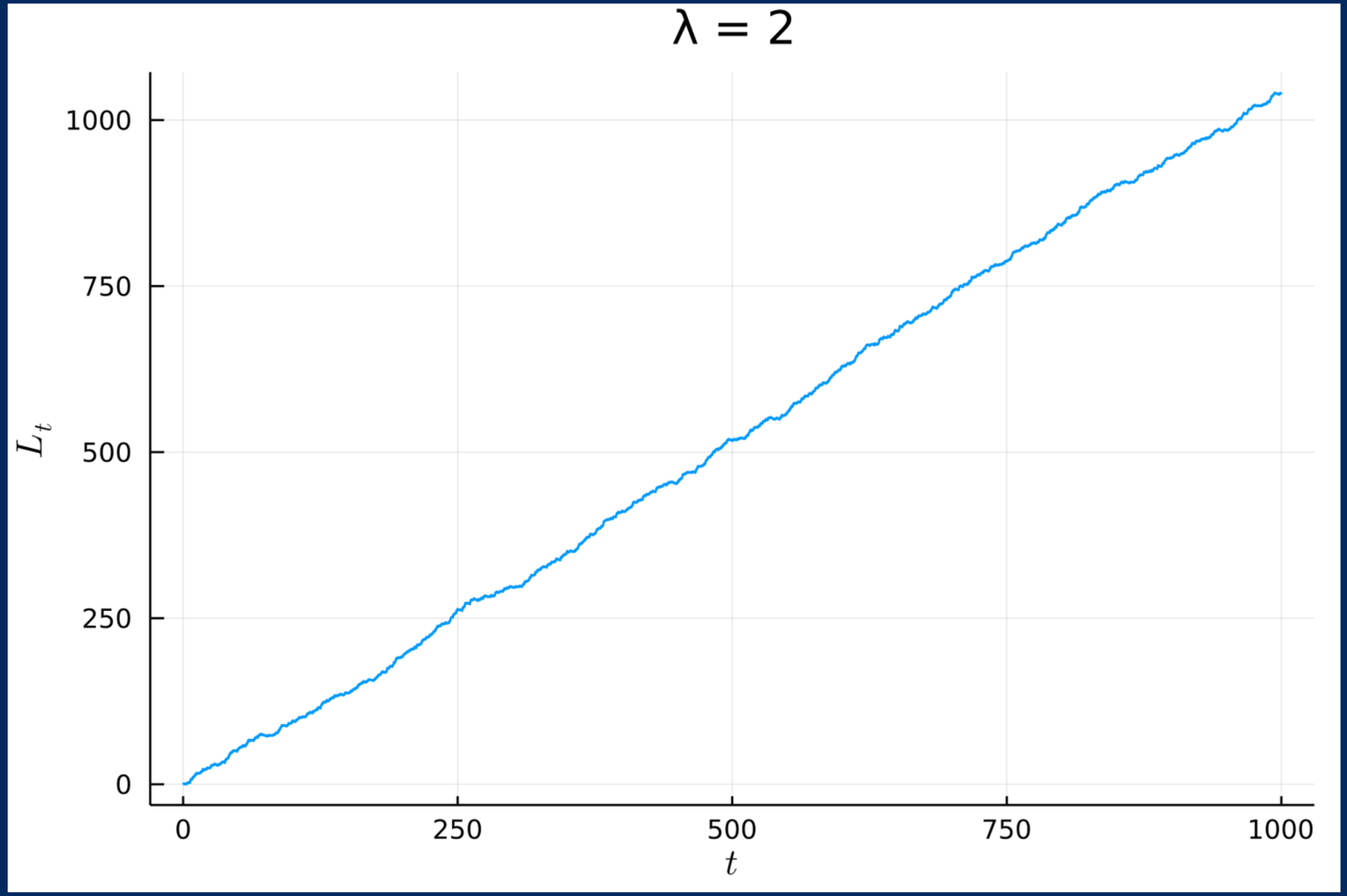
NATALIA KLEPACKA
SZYMON MALEC
FILIP OSZCZEPALIŃSKI
DAMIAN SZUSTER
MICHAŁ WIKTOROWSKI

$$L_t = N_t - P_t$$



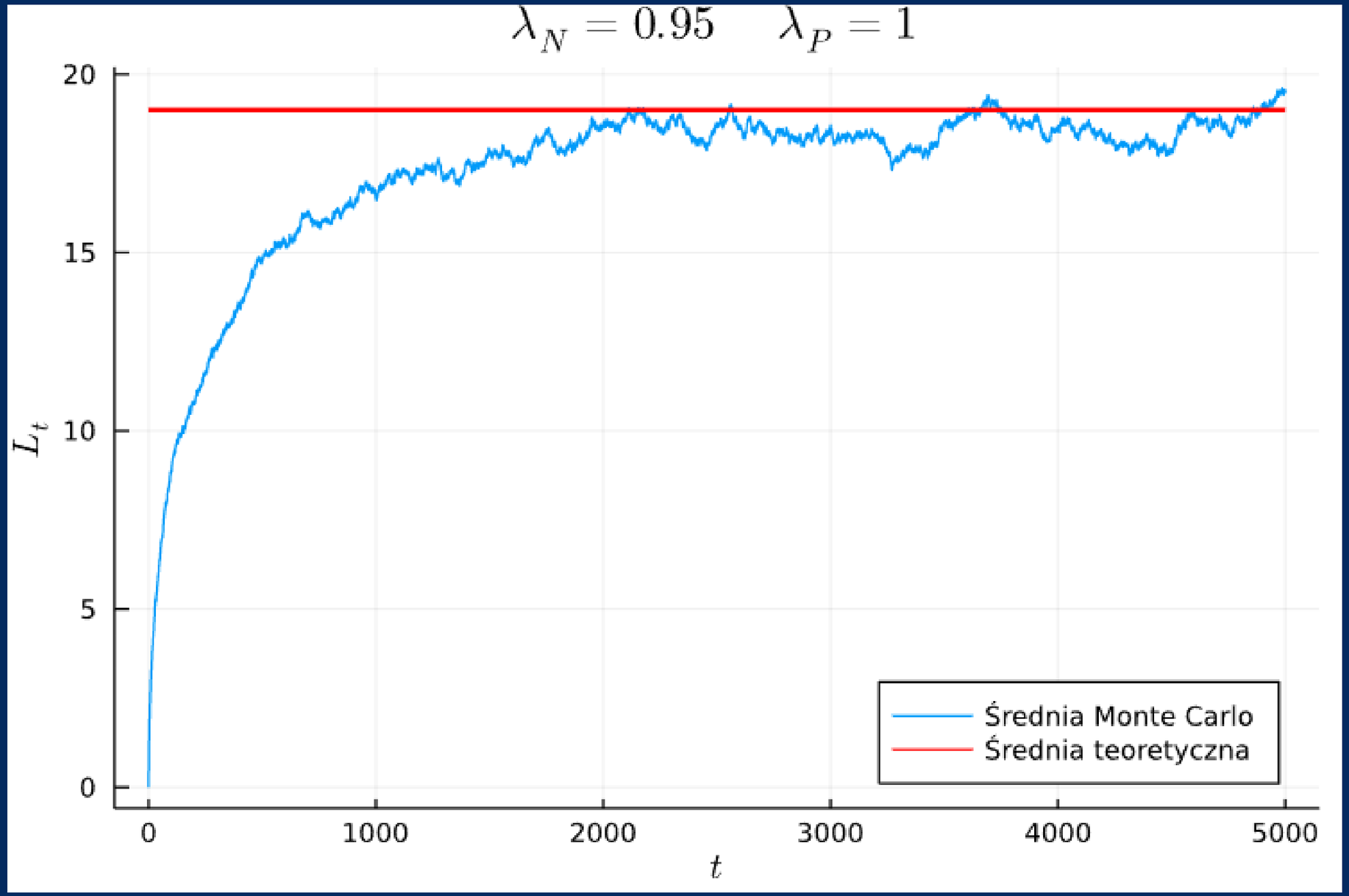

λ = 1
L_t
60
40
20
0
0
250
500
750
1000
t

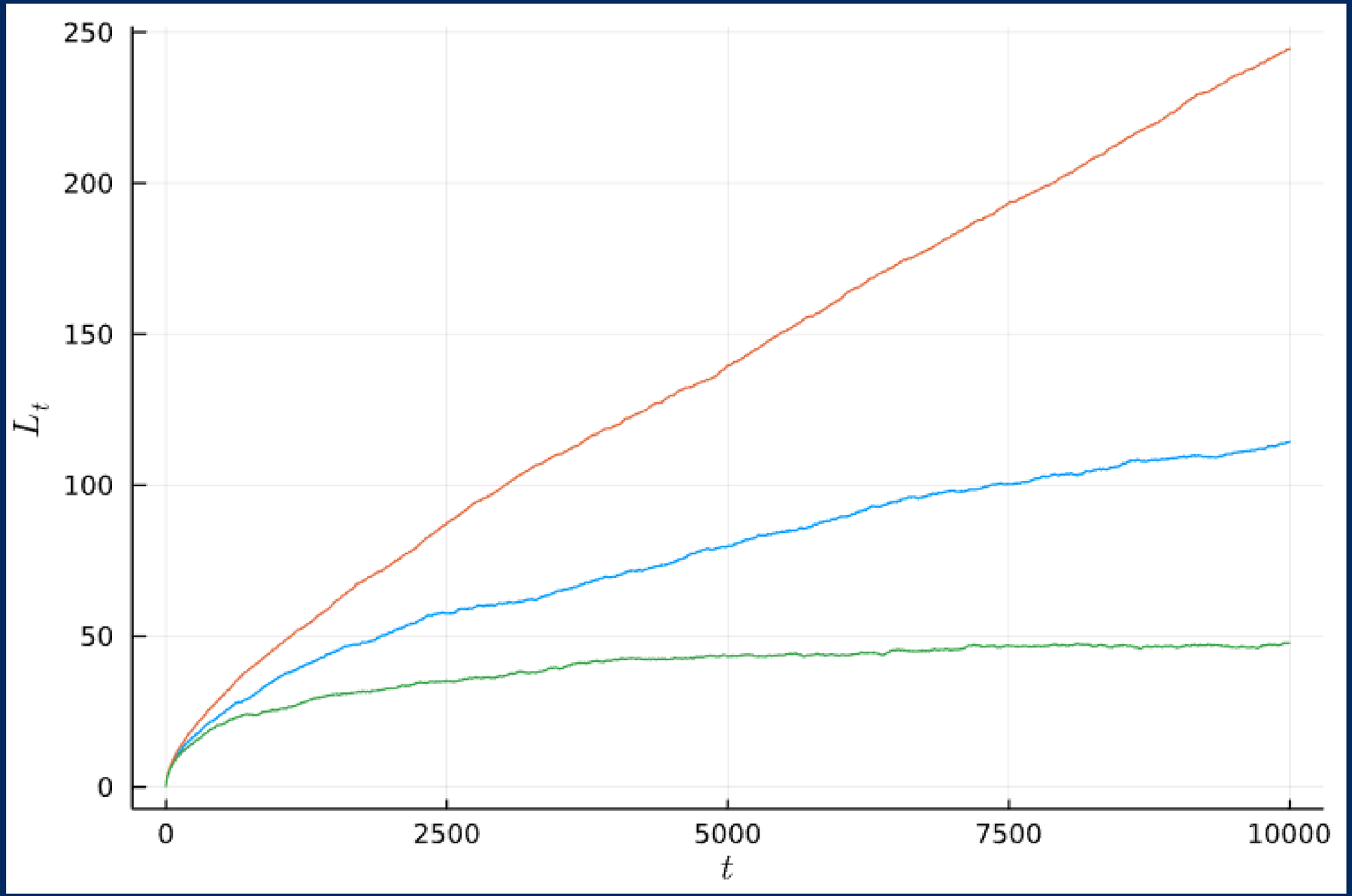

λ = 0.8
10.0
7.5
5.0
2.5
0.0
L_t
0
250
500
750
1000
t


λ = 2
1000
750
500
250
0
L_t
0
250
500
750
1000
t

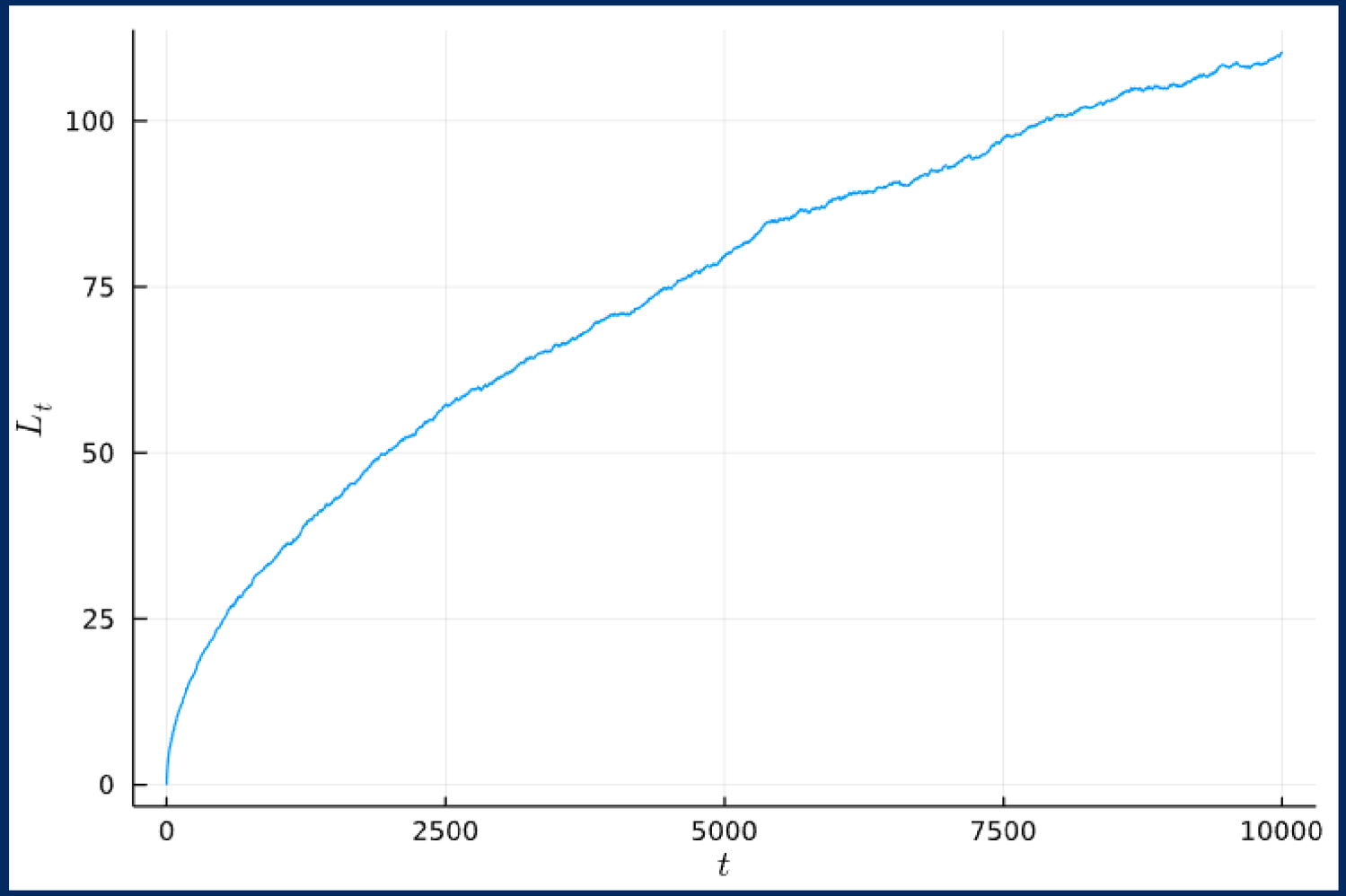
$$\rho = \frac{\lambda_N}{\lambda_P}$$

$$\lim_{t \to \infty} \mathrm{E}L_t = \frac{\rho}{1-\rho} \quad \text{dla} \quad \rho < 1$$

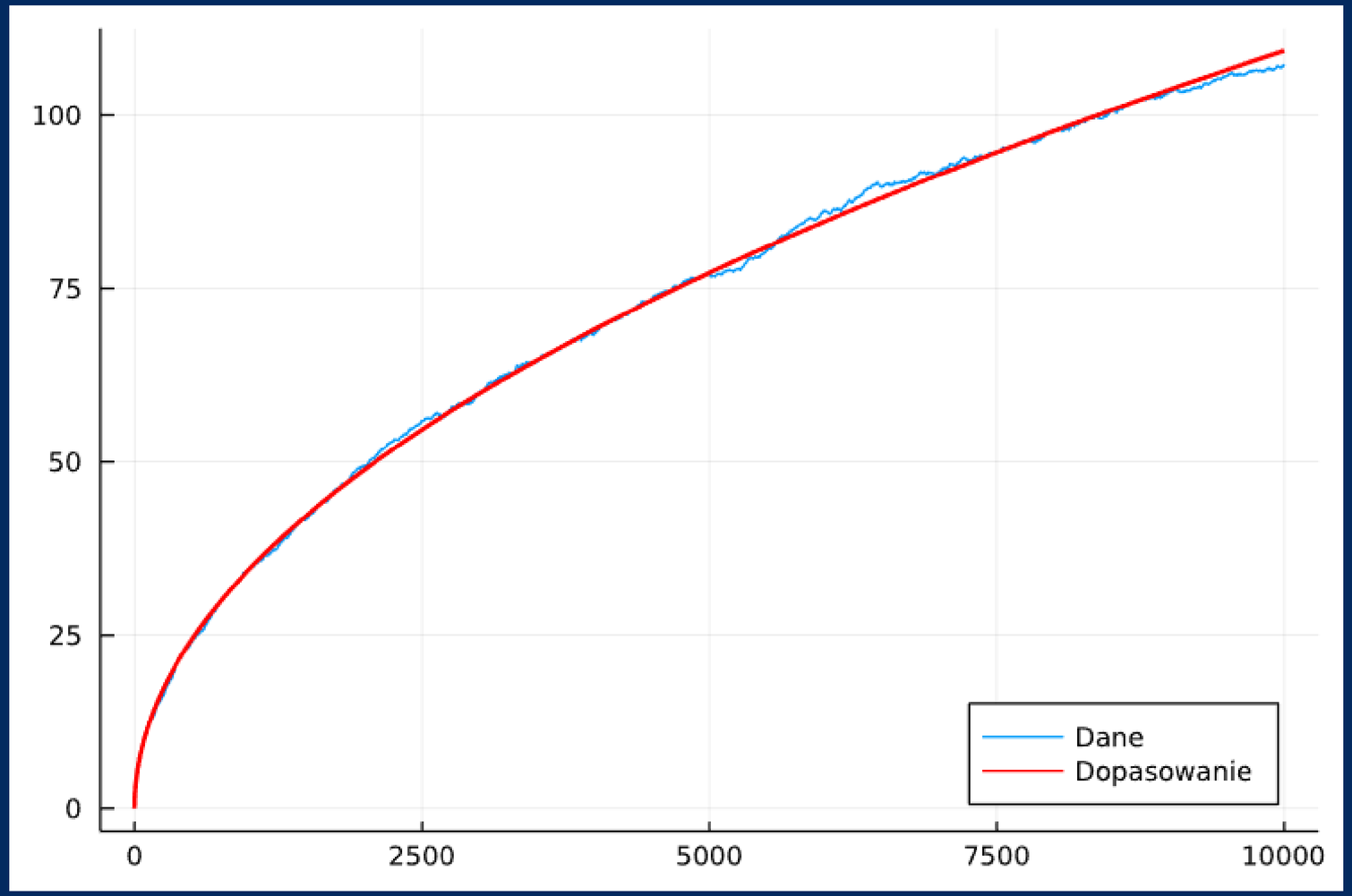

$\lambda_N = 0.95 \quad \lambda_P = 1$
20
15
10
5
0
L_t
0
1000
2000
3000
4000
5000
t
Średnia Monte Carlo
Średnia teoretyczna


250
200
150
100
50
0
L_t
0
2500
5000
7500
10000
t

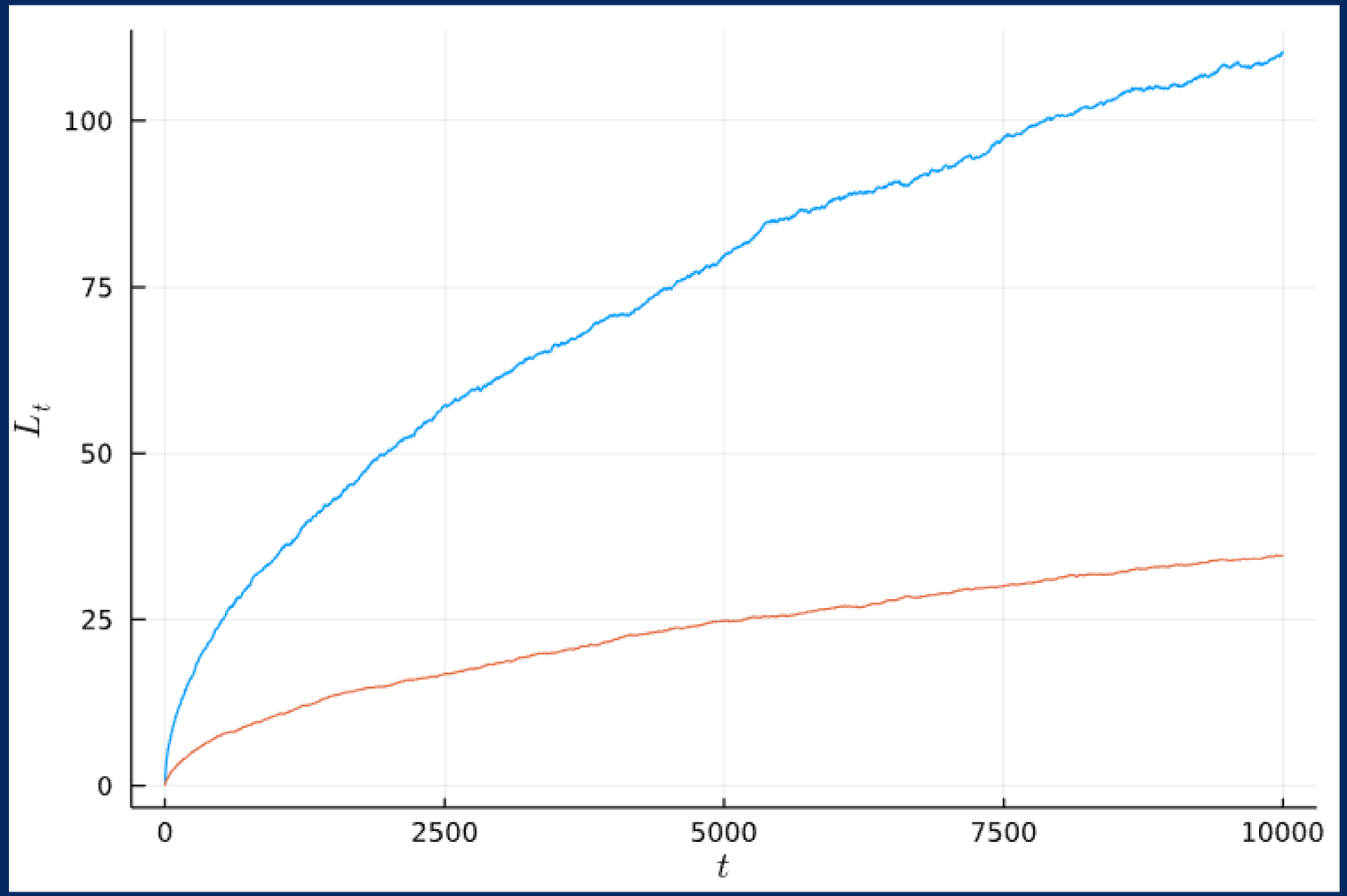
$$\lambda_N = \lambda_P = \lambda$$

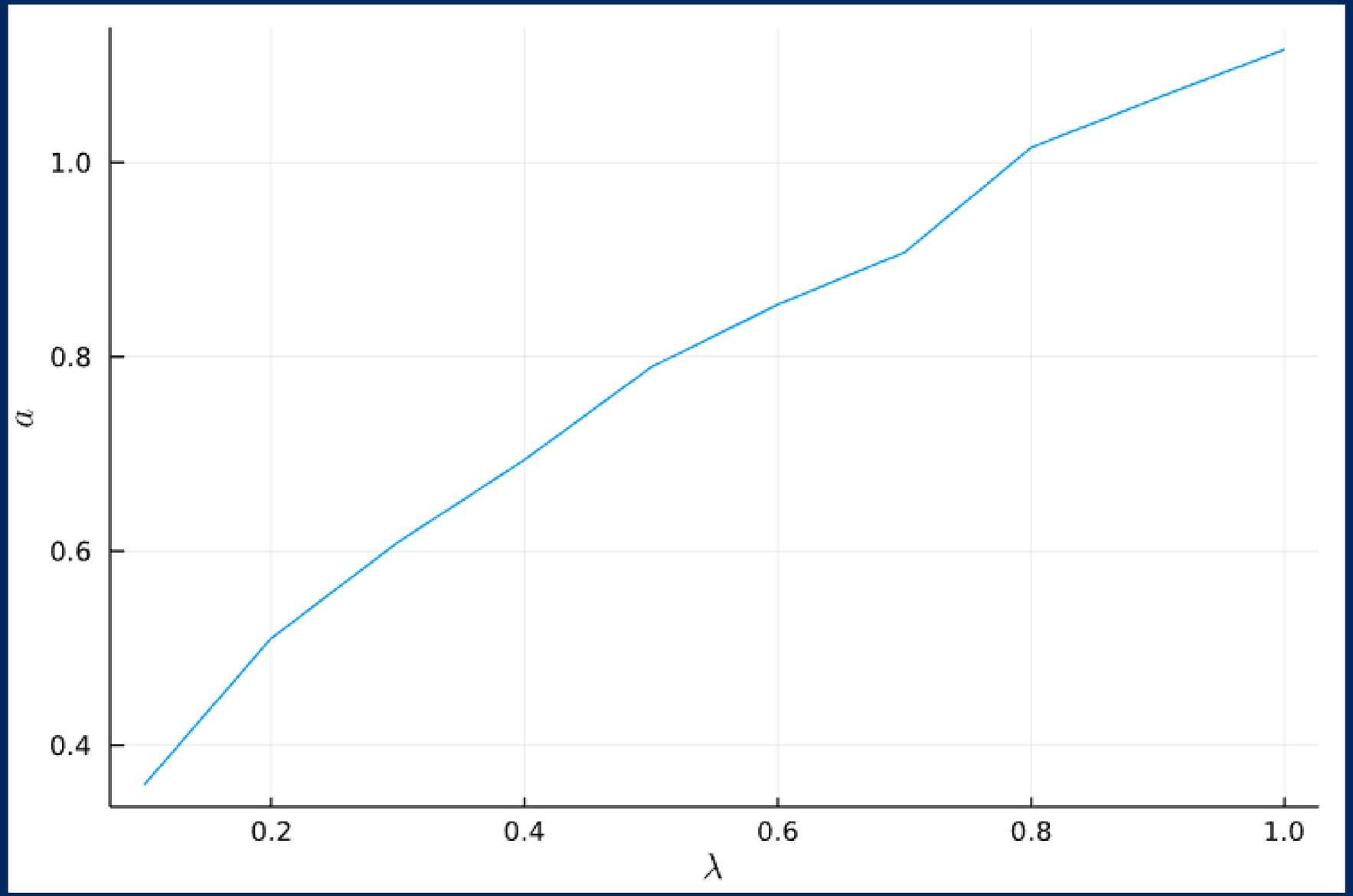


$$\mathrm{E}L_t \approx a\sqrt{t}$$

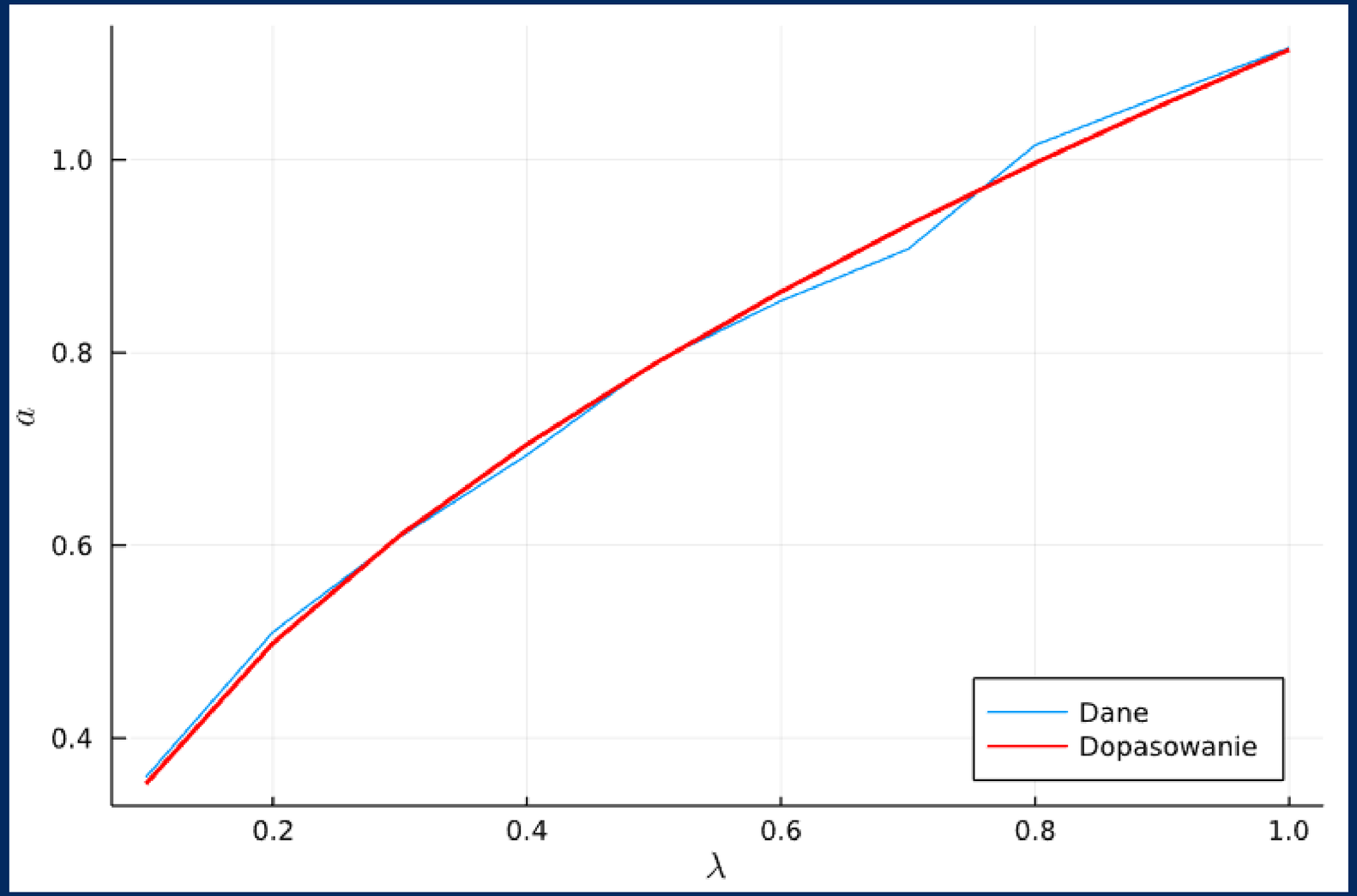


$$a(\lambda) = ?$$




1.0
0.8
0.6
0.4
α
0.2
0.4
0.6
0.8
1.0
λ

$$a(\lambda) = \alpha\sqrt{\lambda}$$

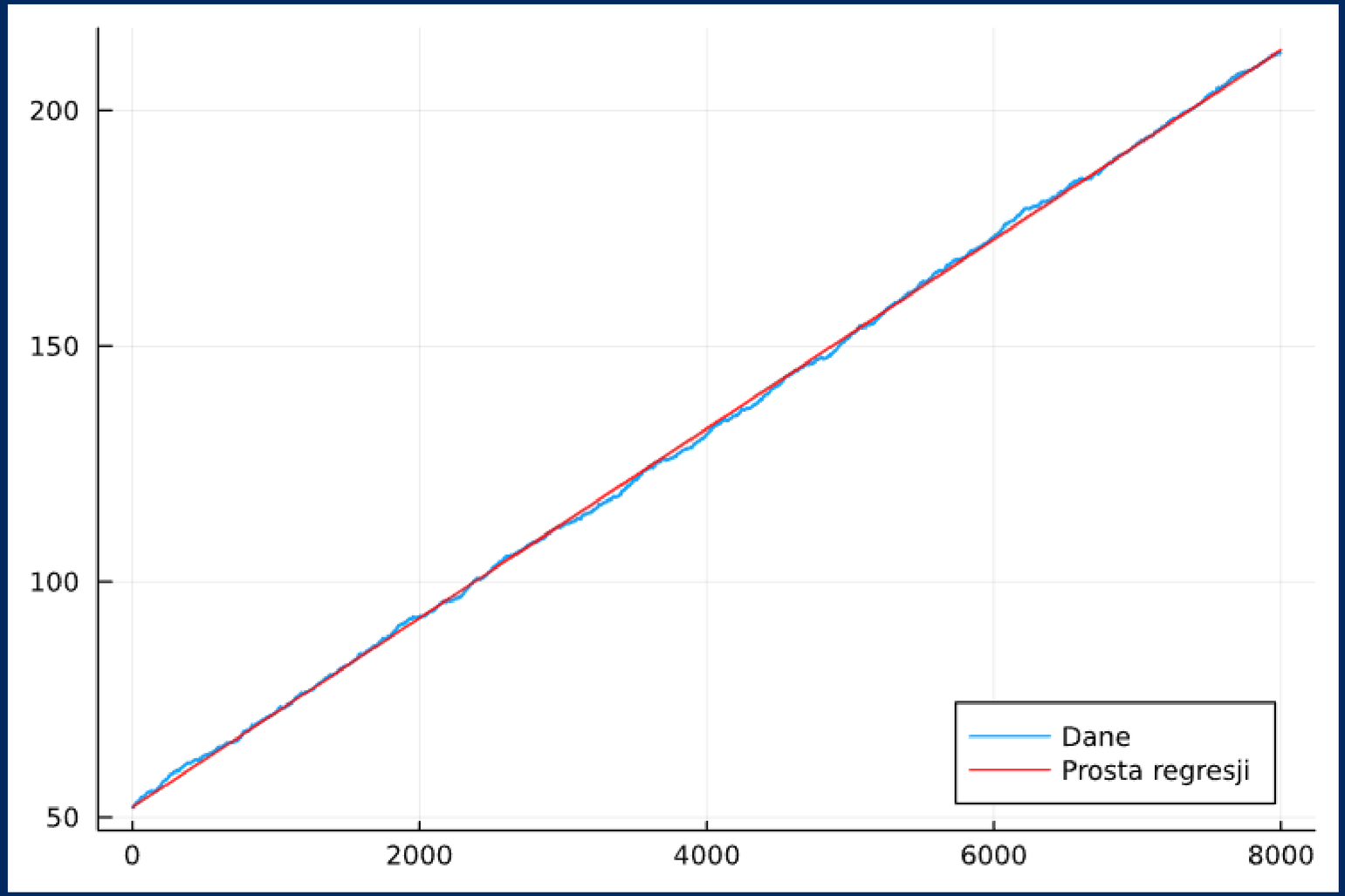


$$\mathrm{E}L_t \approx a\sqrt{t} = \alpha\sqrt{\lambda}\sqrt{t} = 1.1\sqrt{\lambda t}$$

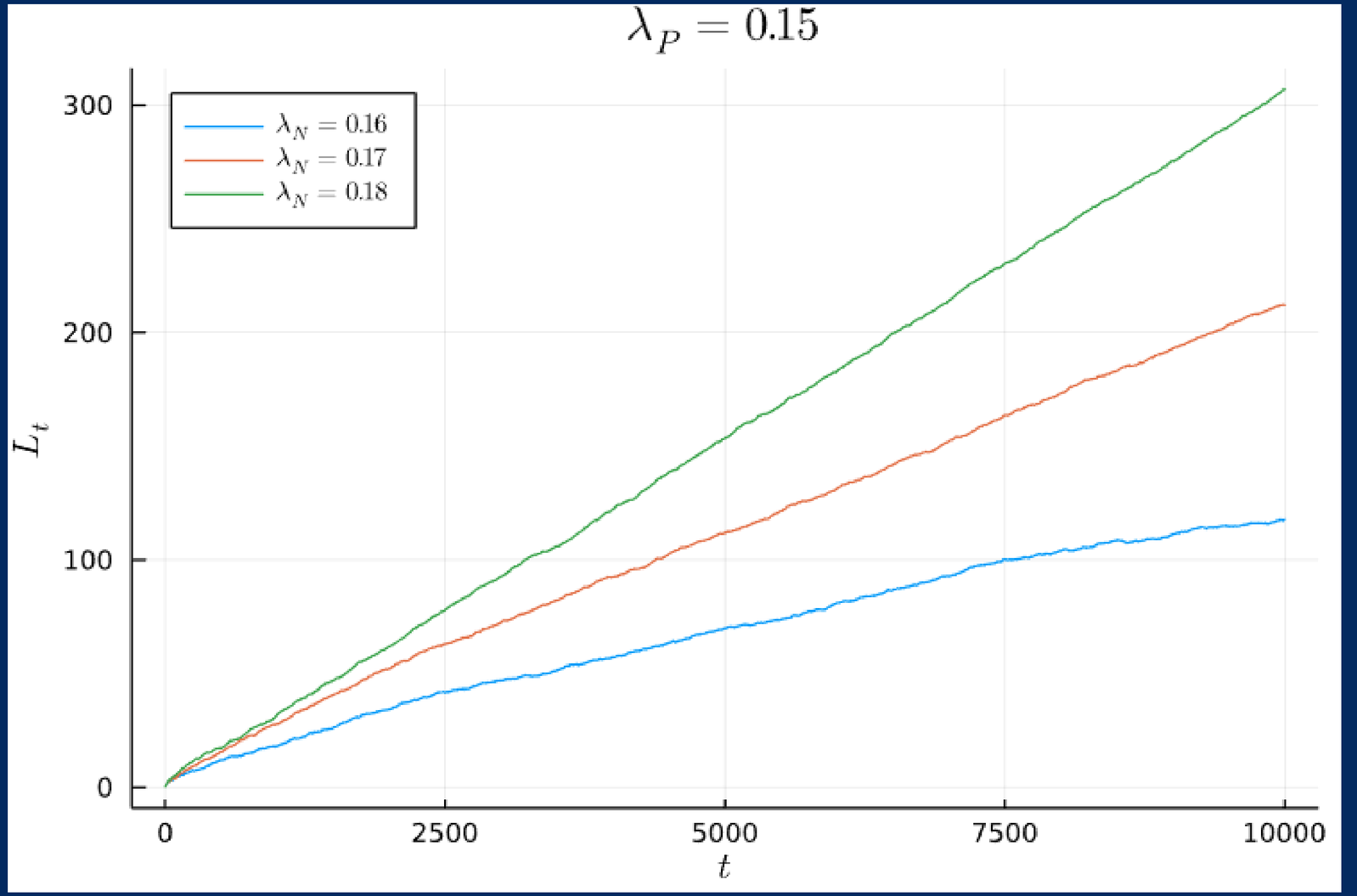
$$\mathrm{E}L_t \approx 1.1\sqrt{\lambda t}$$

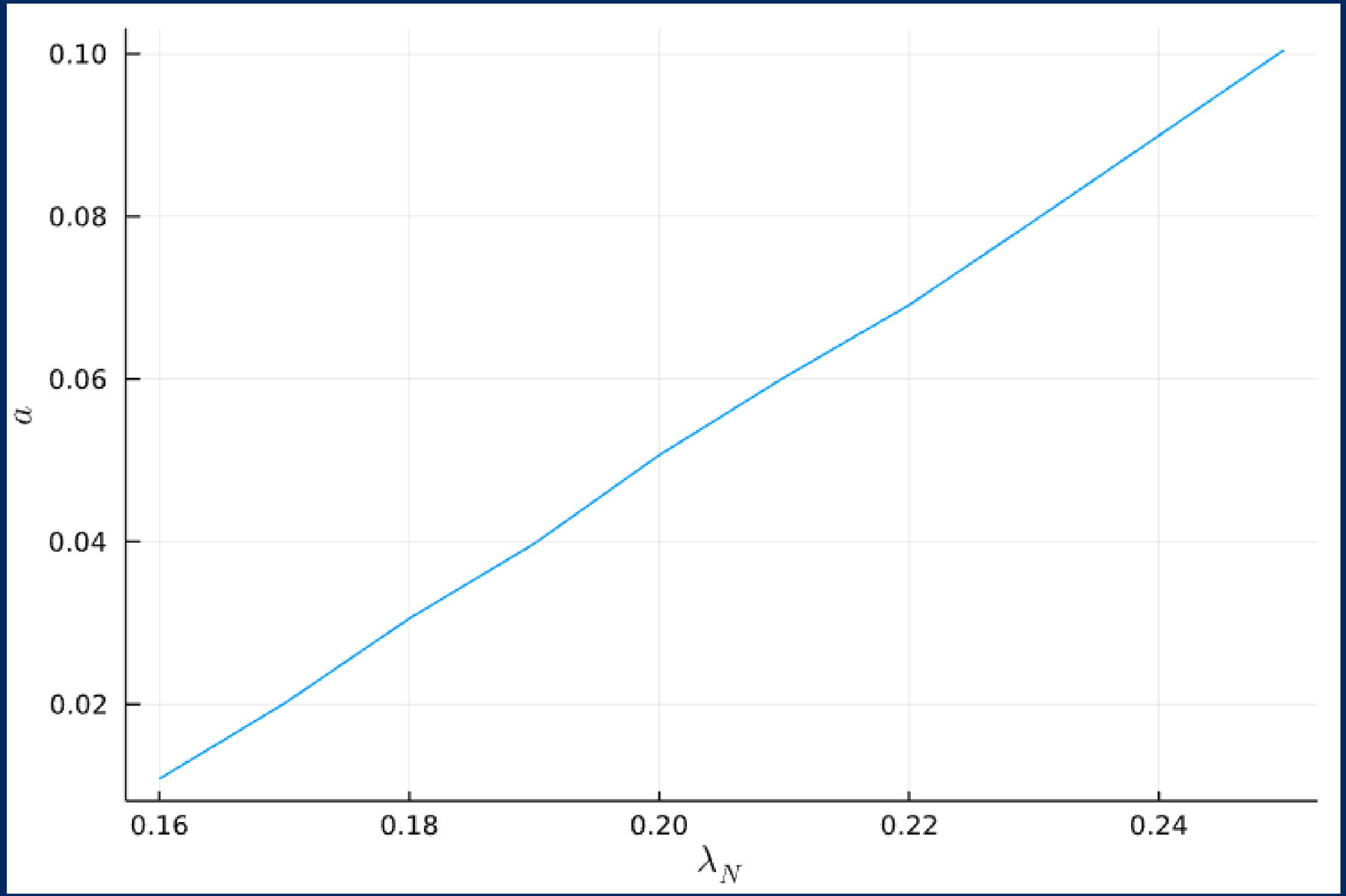
NATĘŻENIE WIĘKSZE OD PRZEPUSTOWOŚCI

$$\mathrm{E}L_t \approx L_0 + at$$

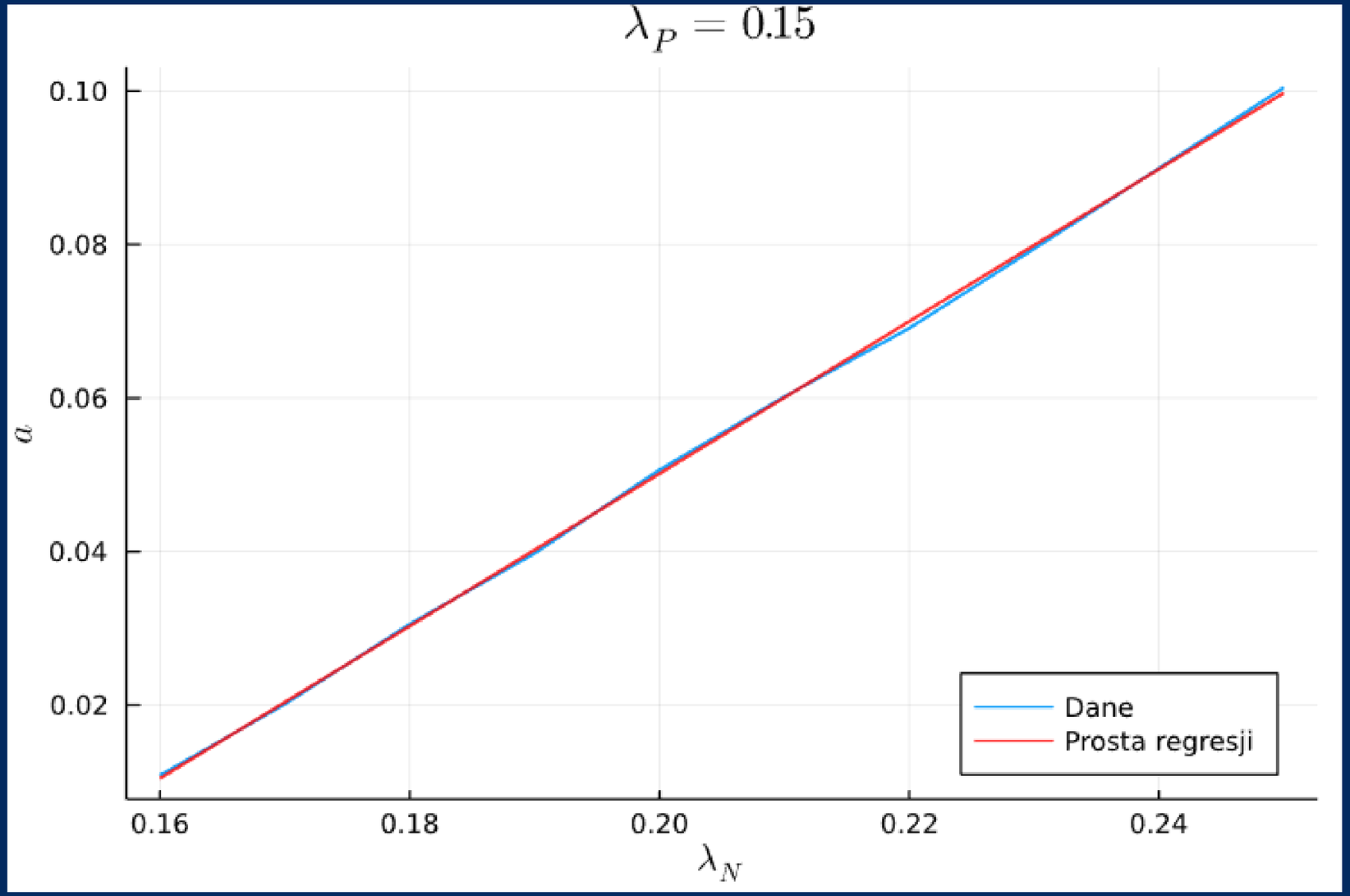


$a(\lambda_N, \lambda_P) = ?$

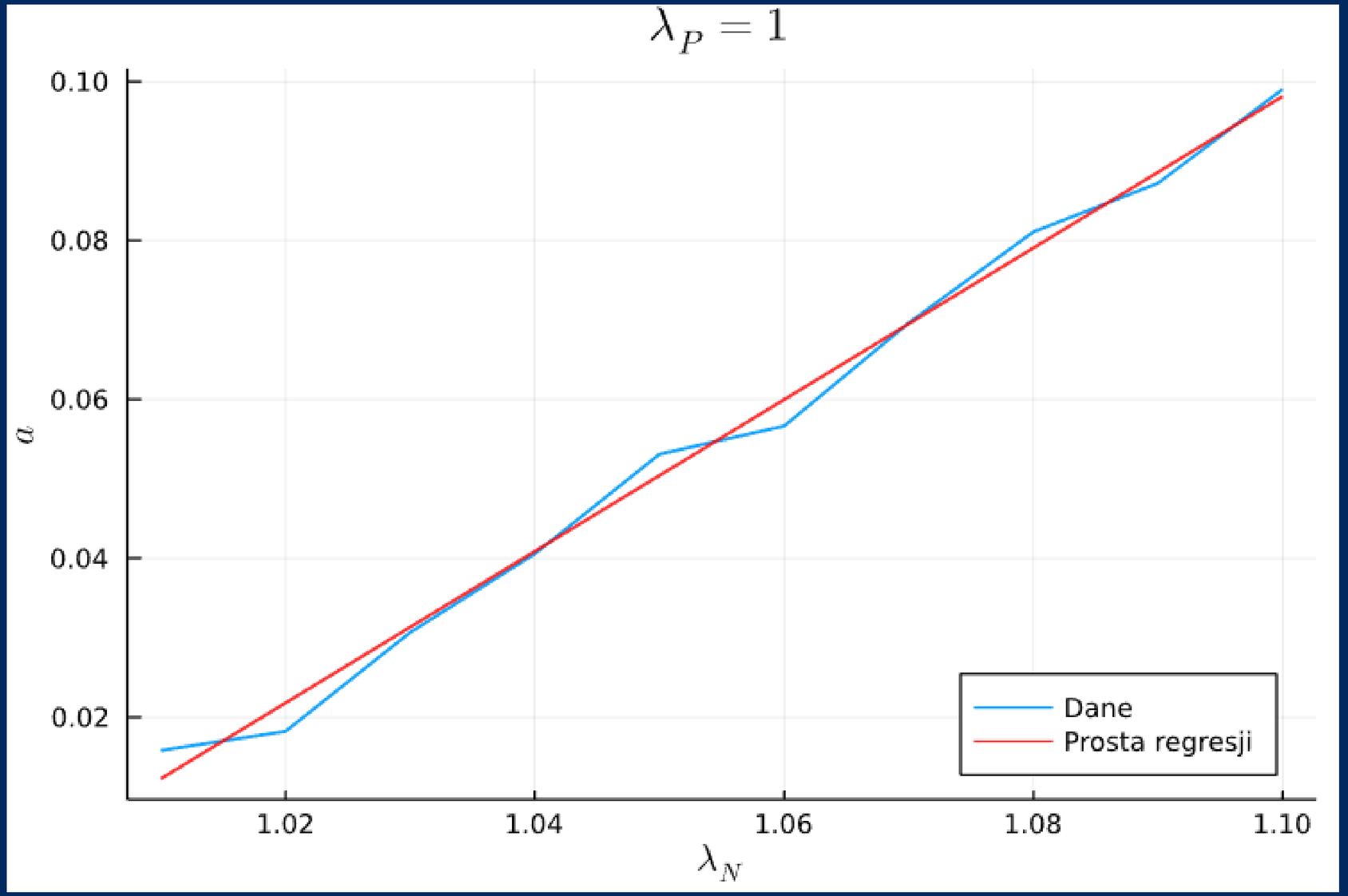



0.10
0.08
0.06
0.04
0.02
a
0.16
0.18
0.20
0.22
0.24
λ_N

$$a(\lambda_N, 0.15) \approx \lambda_N - 0.15$$



$$a(\lambda_N, 1) \approx 0.95\lambda_N - 0.95 = 0.95(\lambda_N - 1)$$



DZIĘKUJEMY ZA UWAGĘ