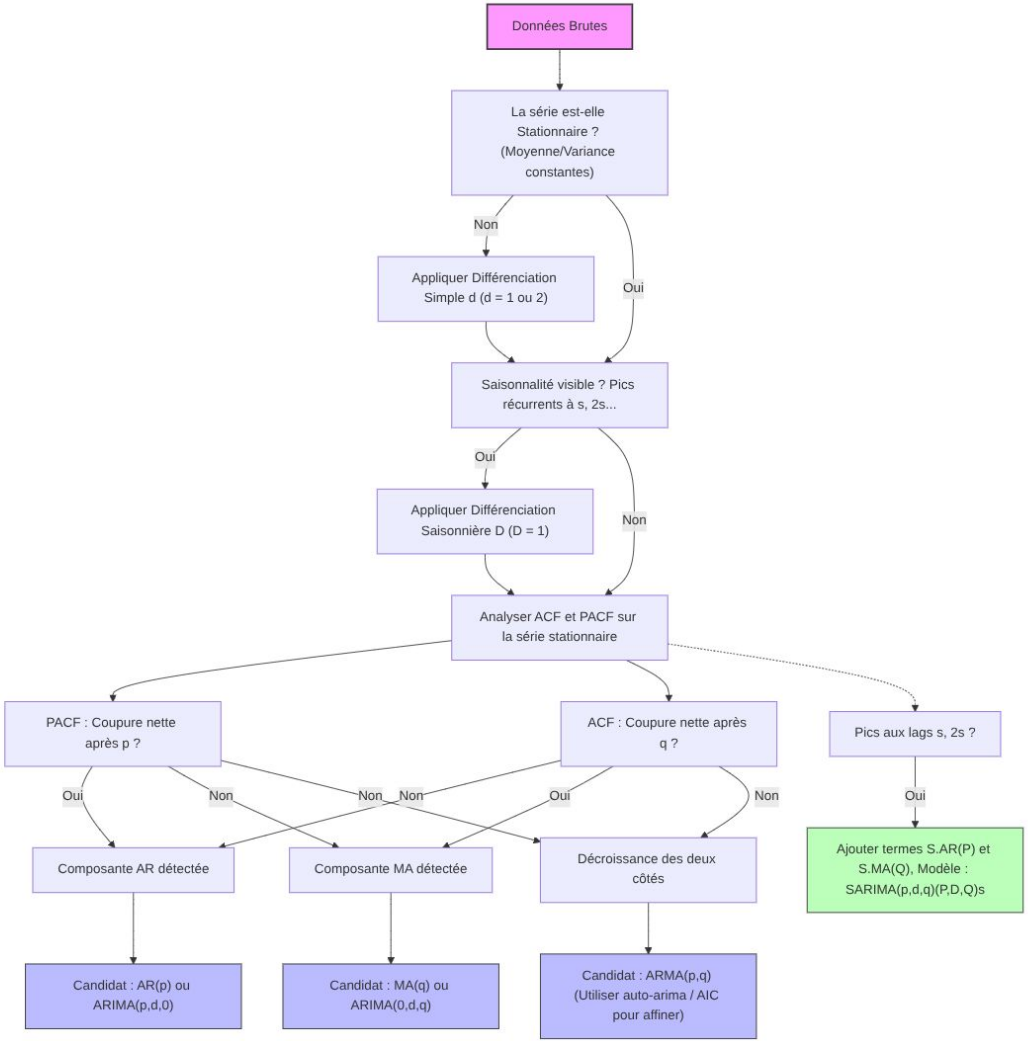
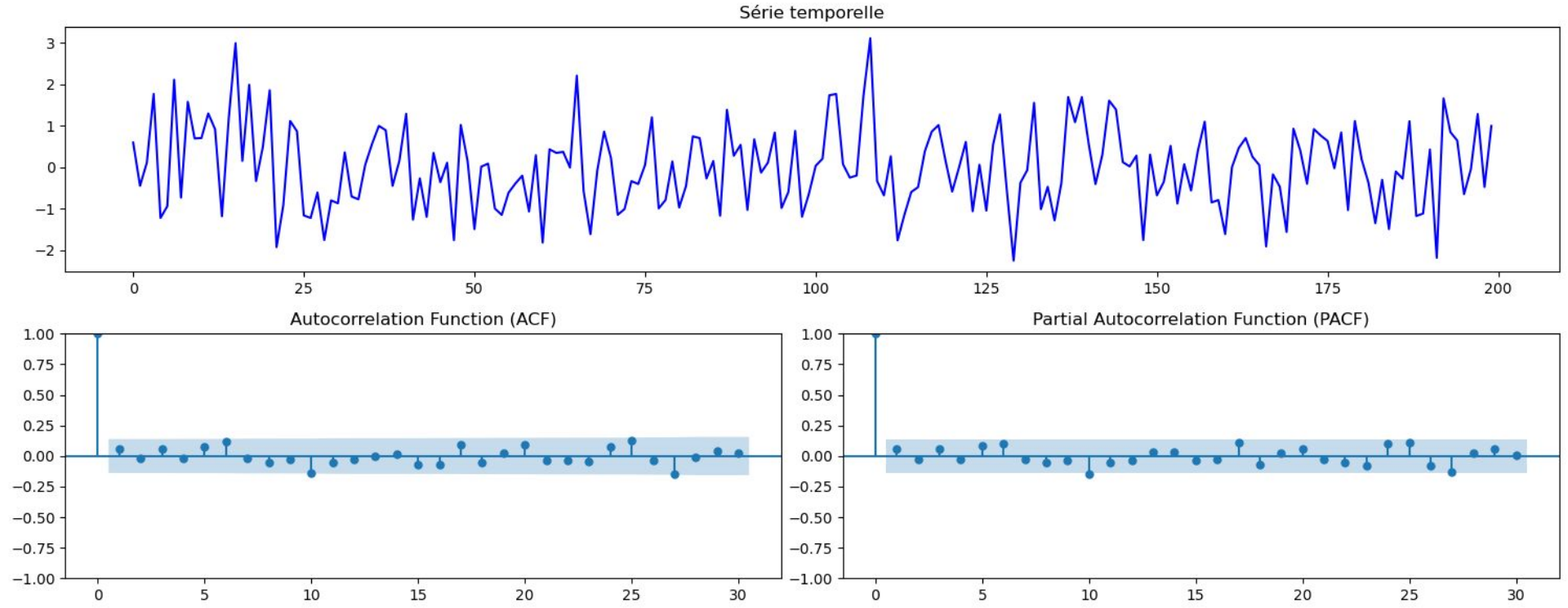
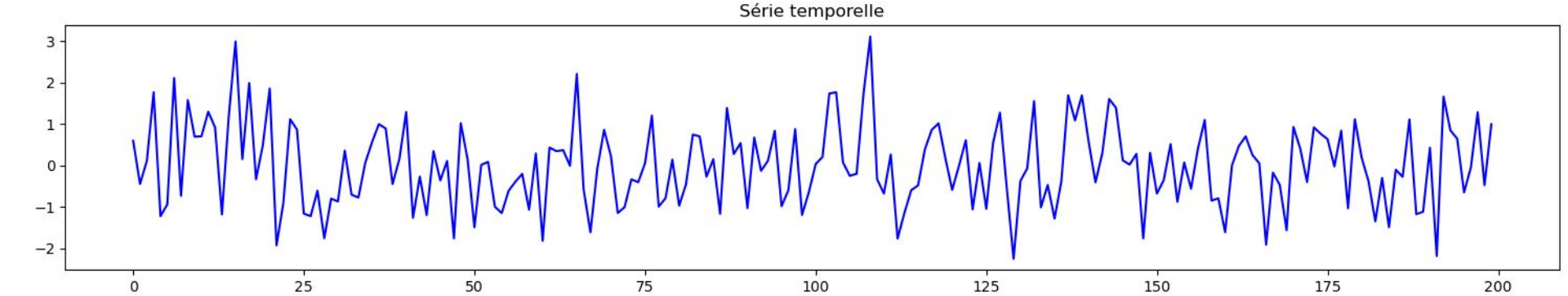
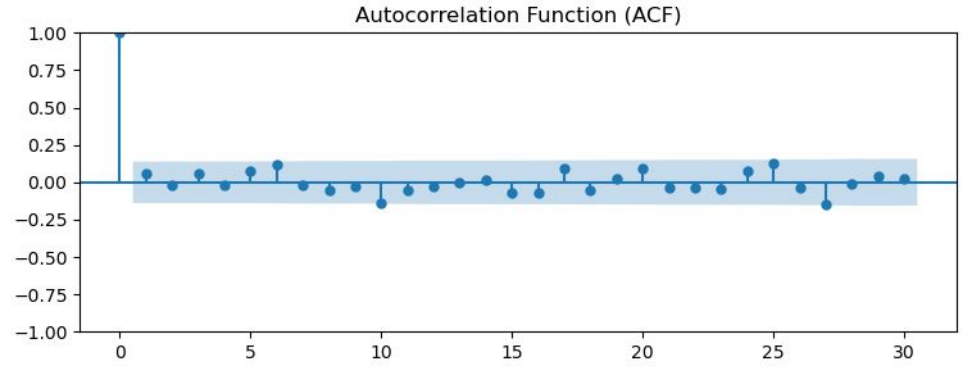
Choisir son modèle à partir des corrélogrammes

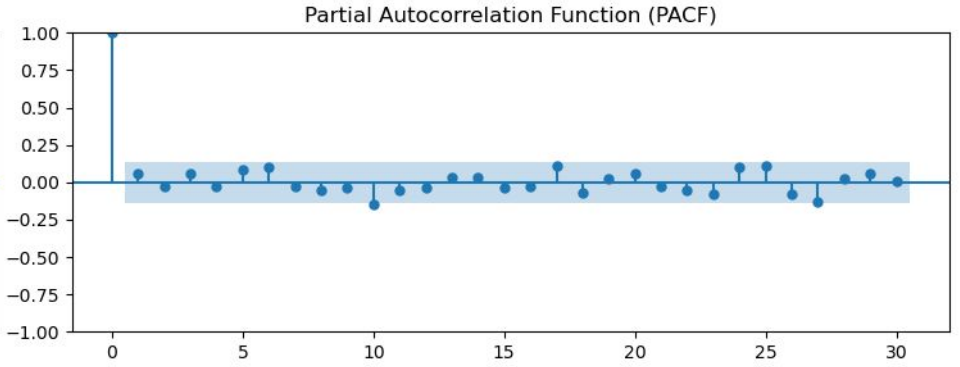
VUE GENERALE




Série temporelle
Autocorrelation Function (ACF)
Partial Autocorrelation Function (PACF)

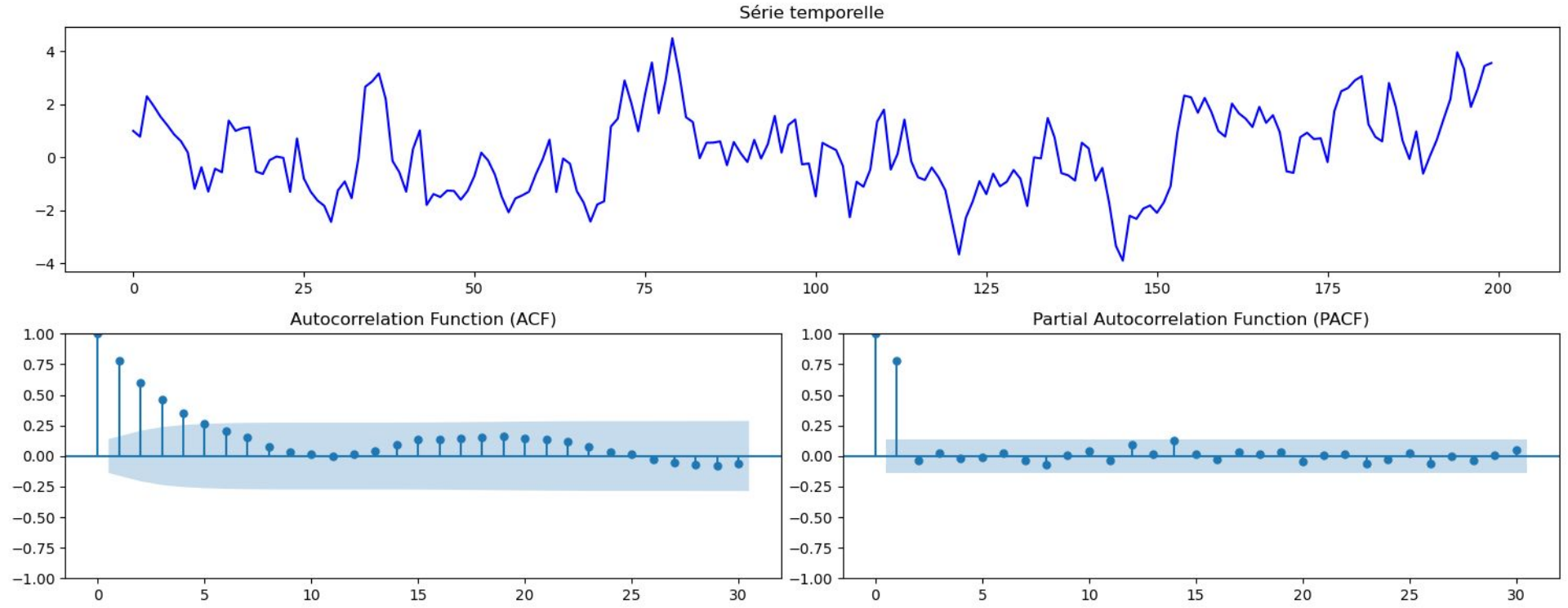


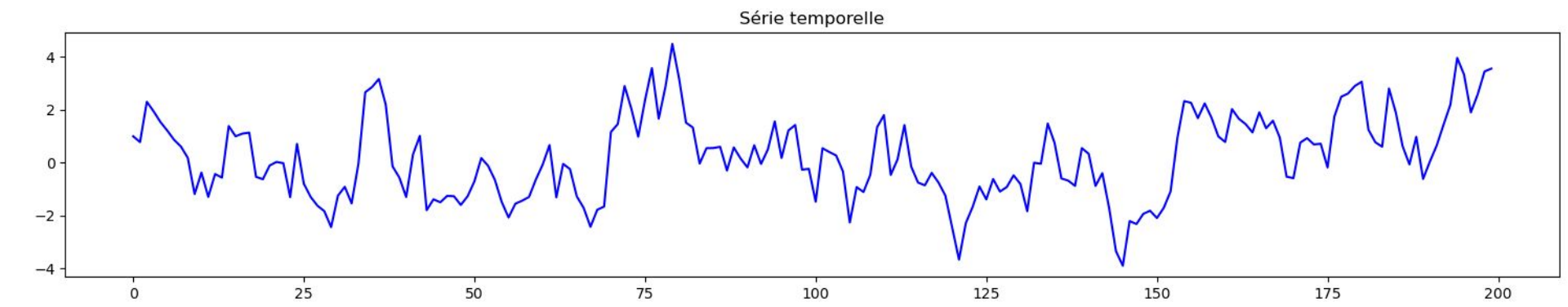


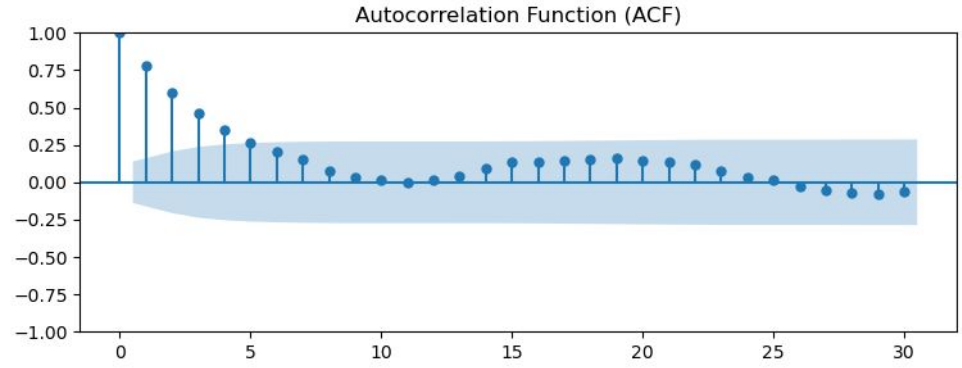


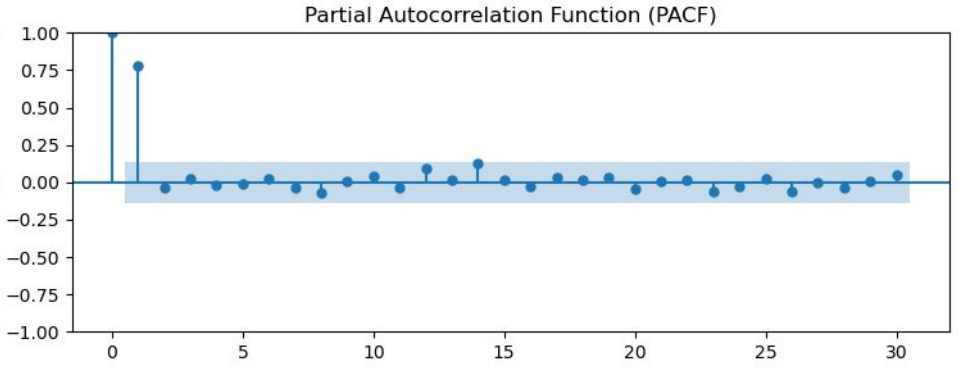
- Aucun lag n’est significatif

>>> Bruit blanc


Série temporelle
Autocorrelation Function (ACF)
Partial Autocorrelation Function (PACF)

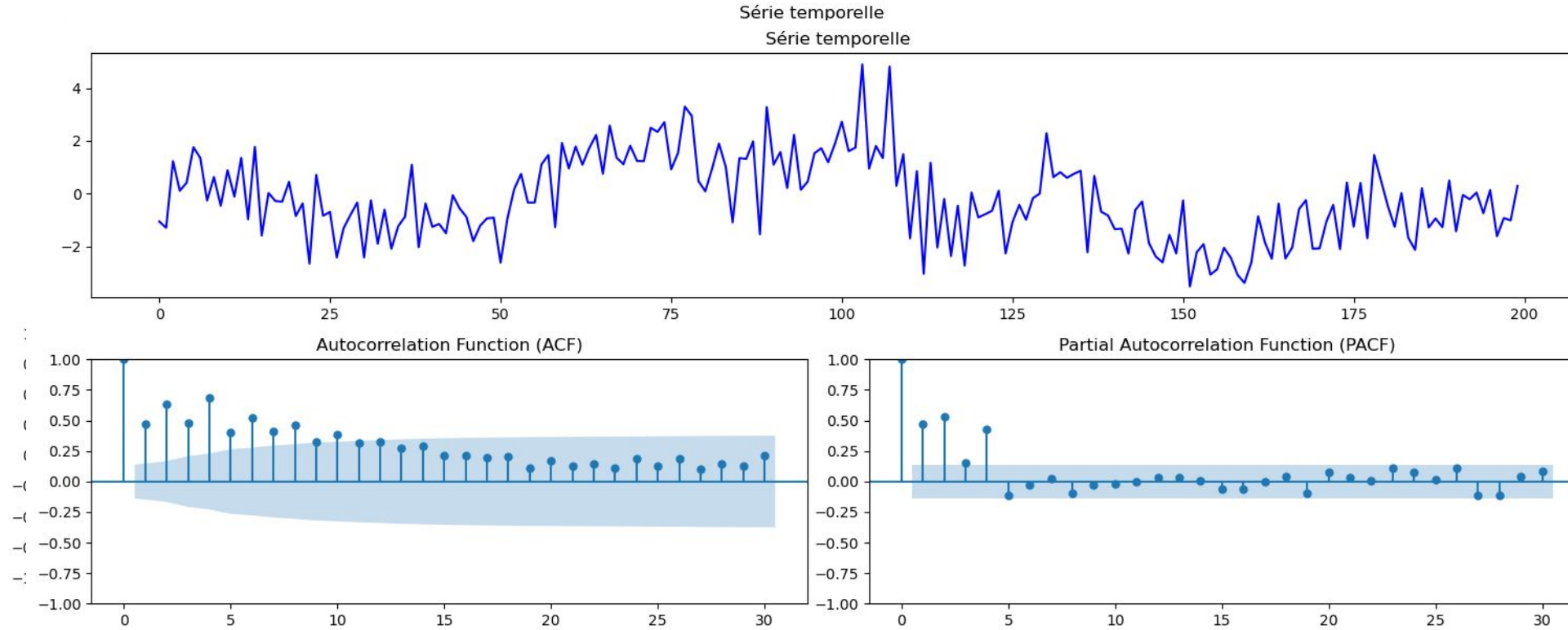


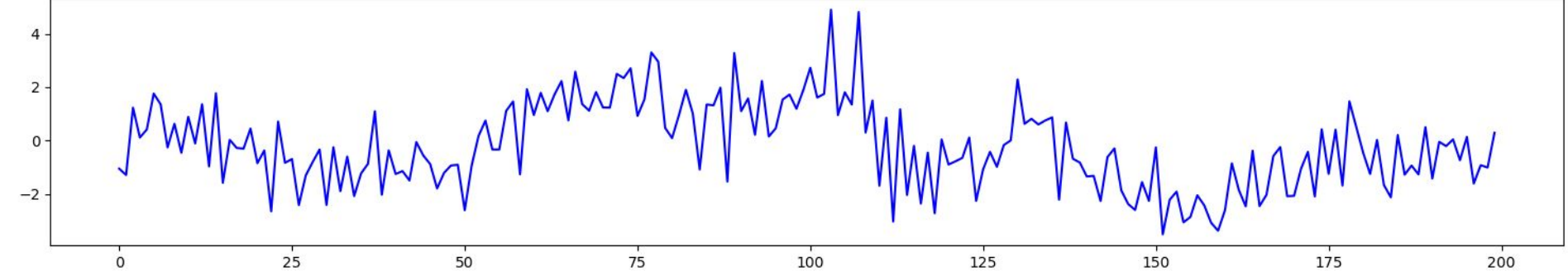


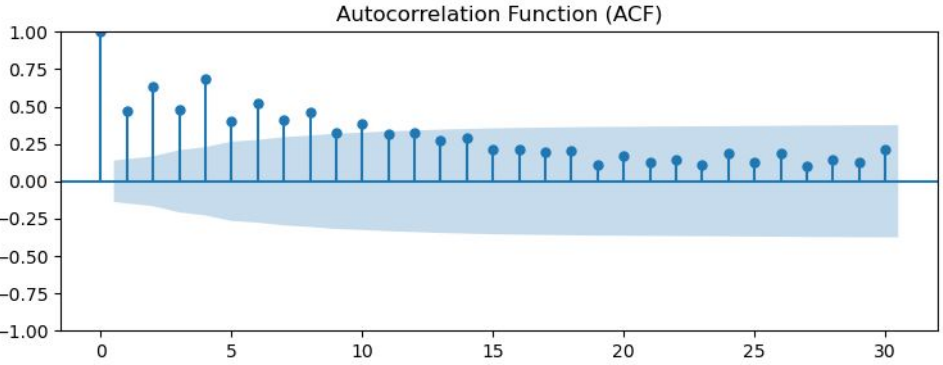


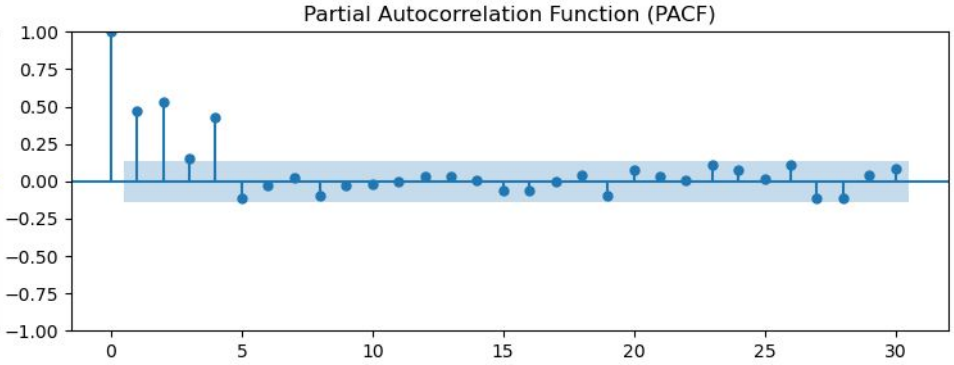
- Décroissance progressive des ACF
- Cutoff des PACF au premier lag

>> AR(1)


Série temporelle
Série temporelle
Autocorrelation Function (ACF)
Partial Autocorrelation Function (PACF)

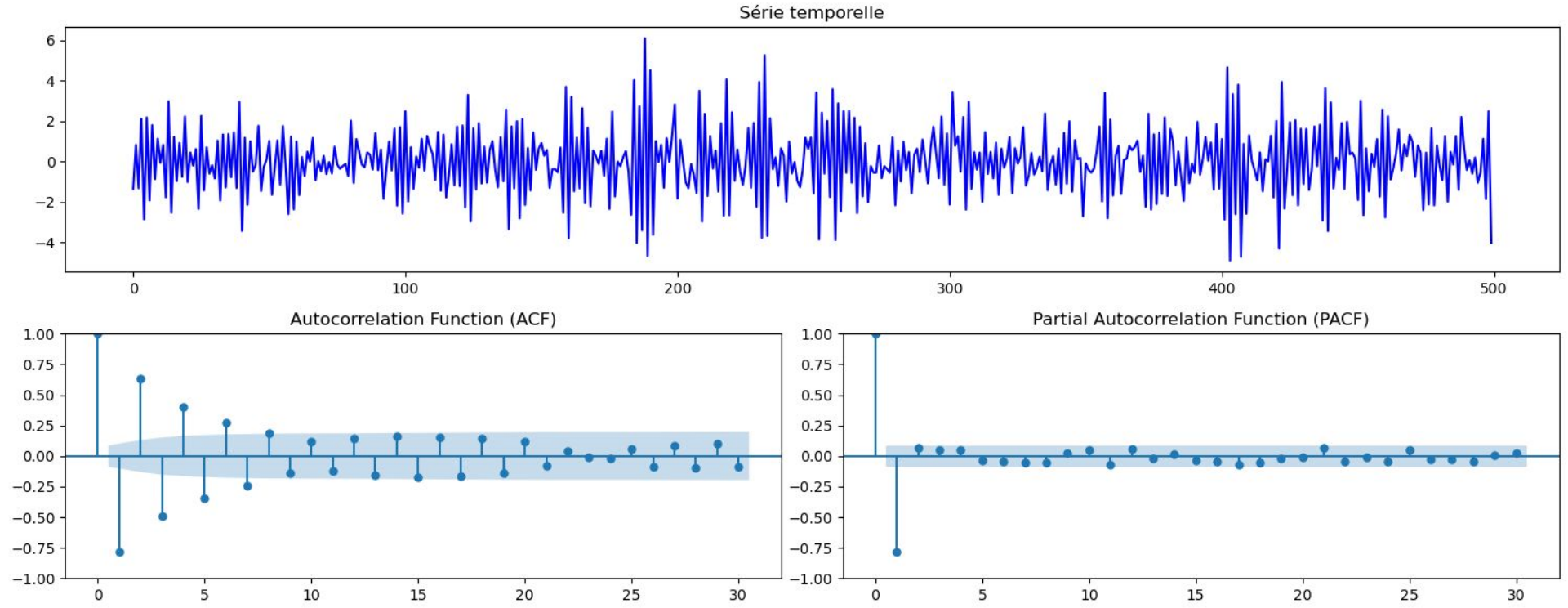


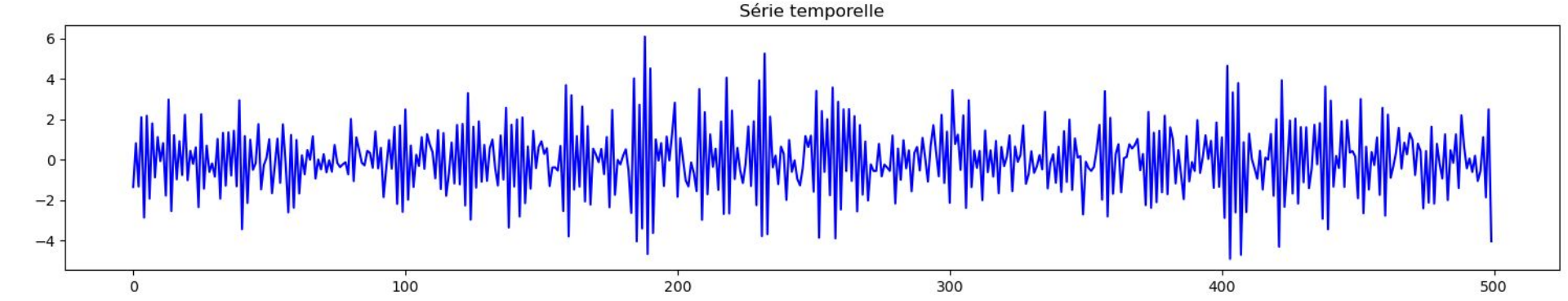


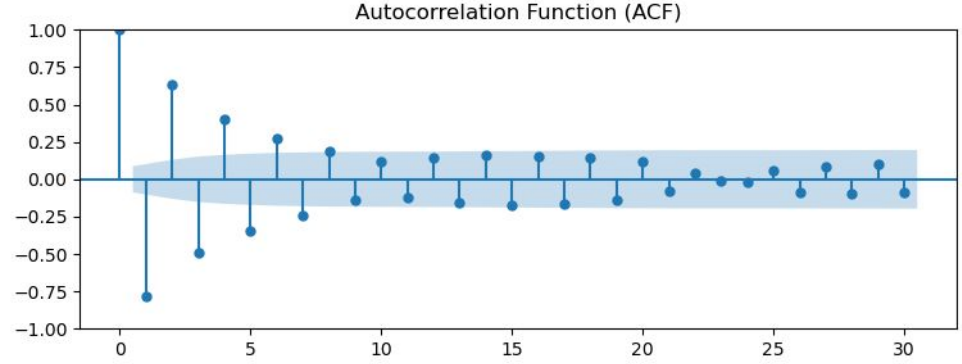


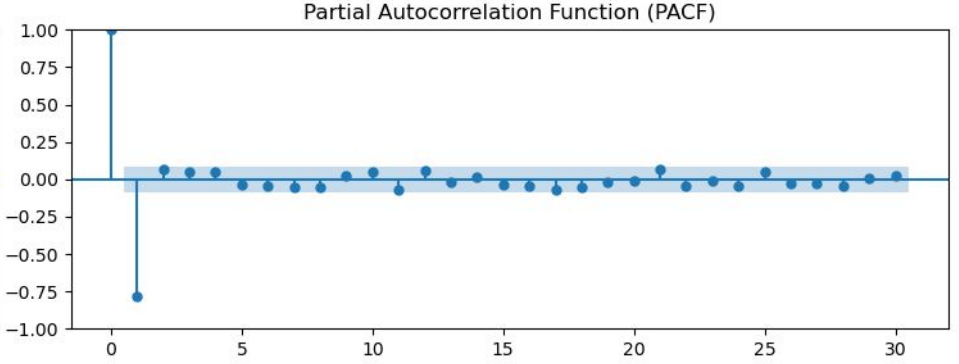
- Décroissance progressive des ACF
- Cutoff des PACF au lag 4

>> AR(4)


Série temporelle
Autocorrelation Function (ACF)
Partial Autocorrelation Function (PACF)

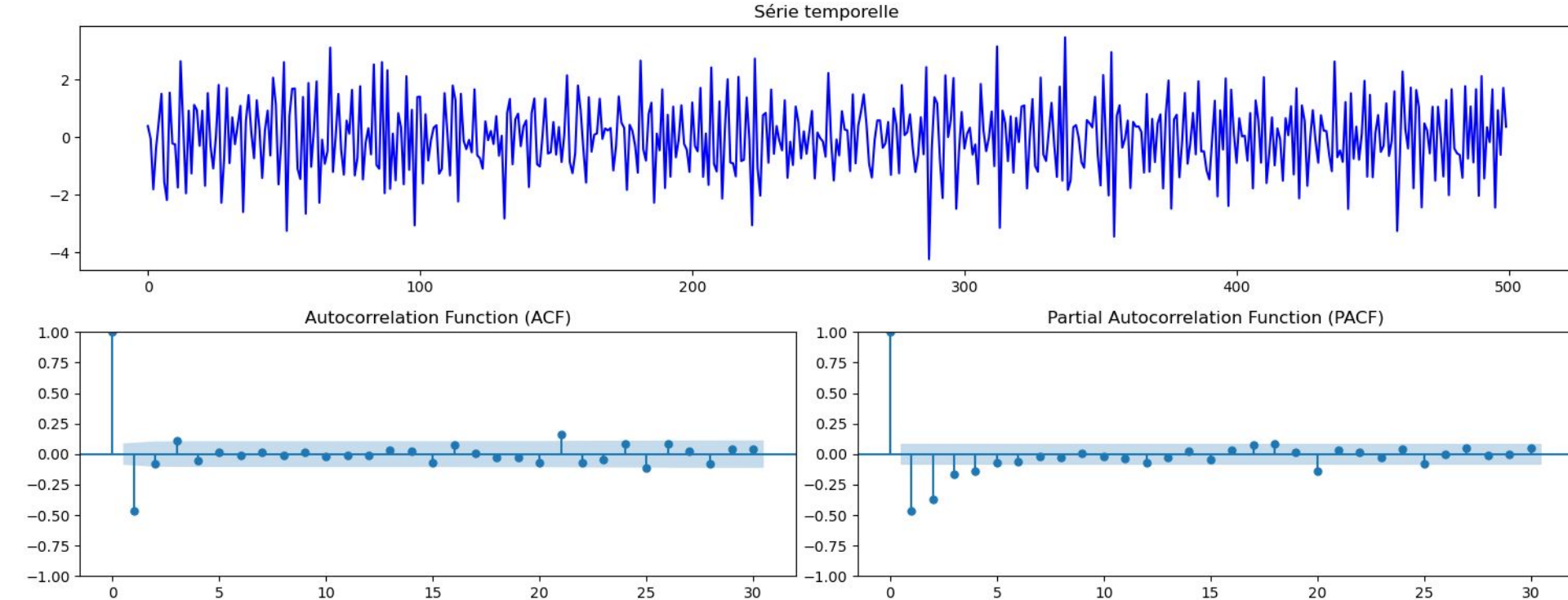


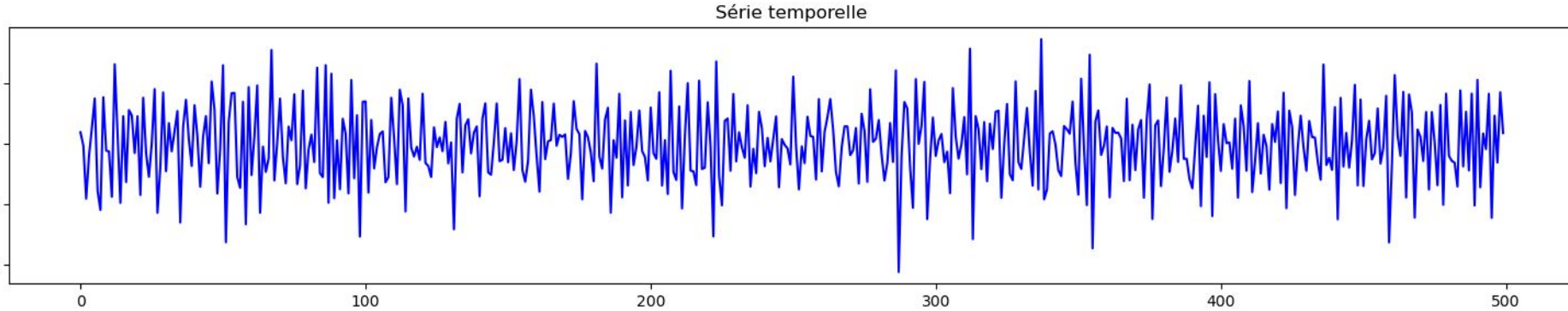


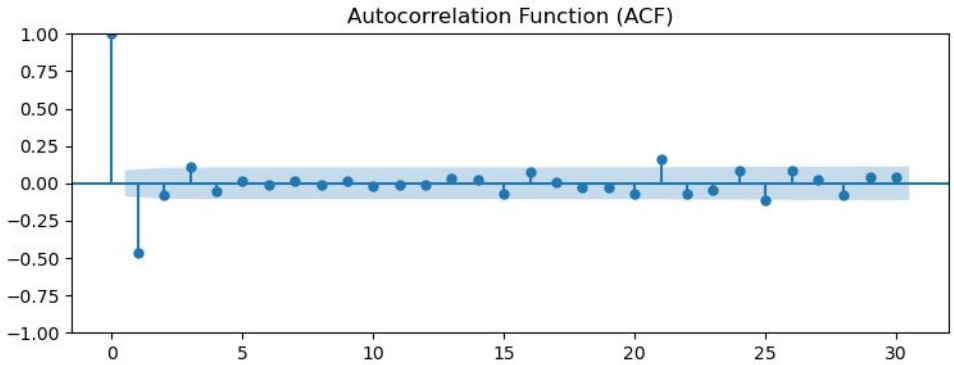


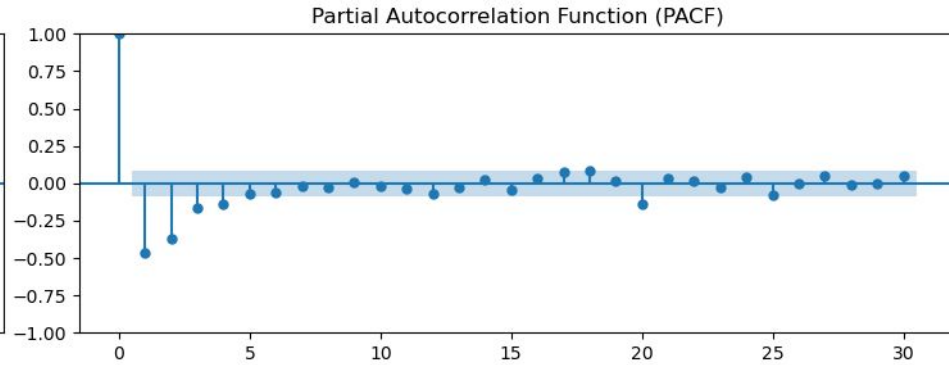
- Décroissance progressive des ACF (alternée -> phi négatif)
- Cutoff au lag 1

>> AR(1)


Série temporelle
Autocorrelation Function (ACF)
Partial Autocorrelation Function (PACF)

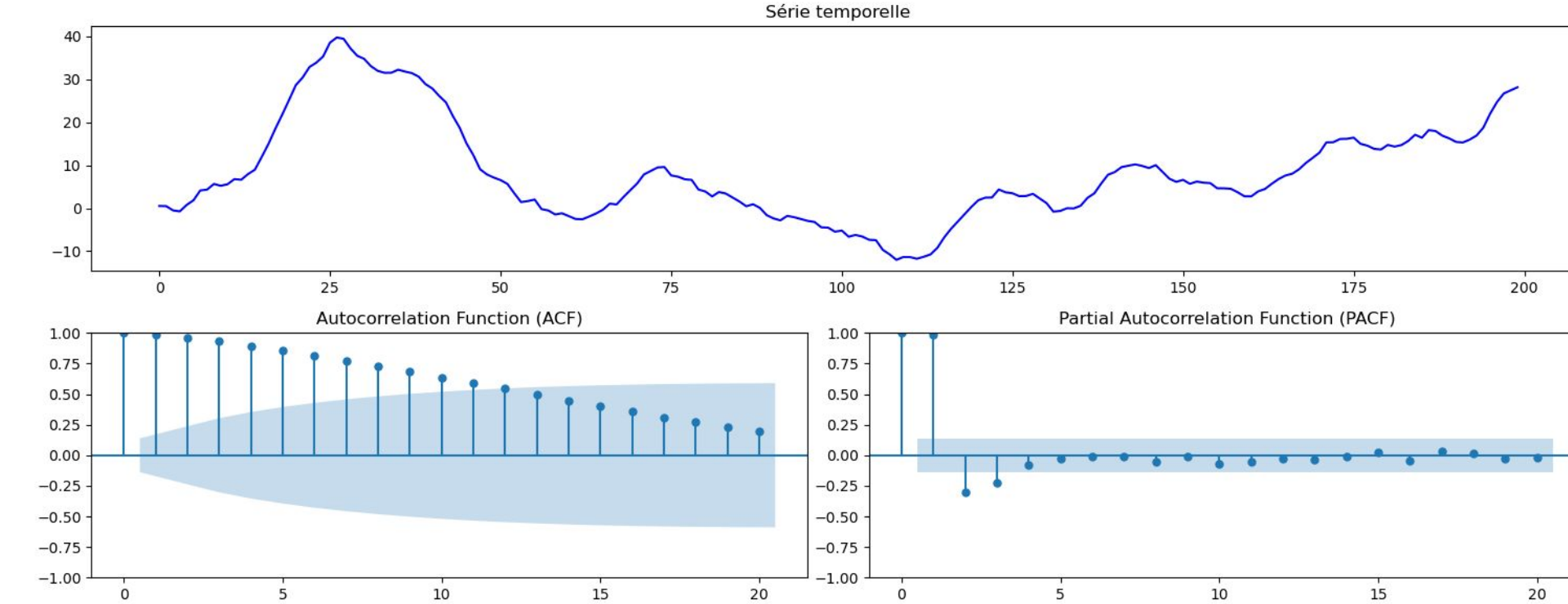


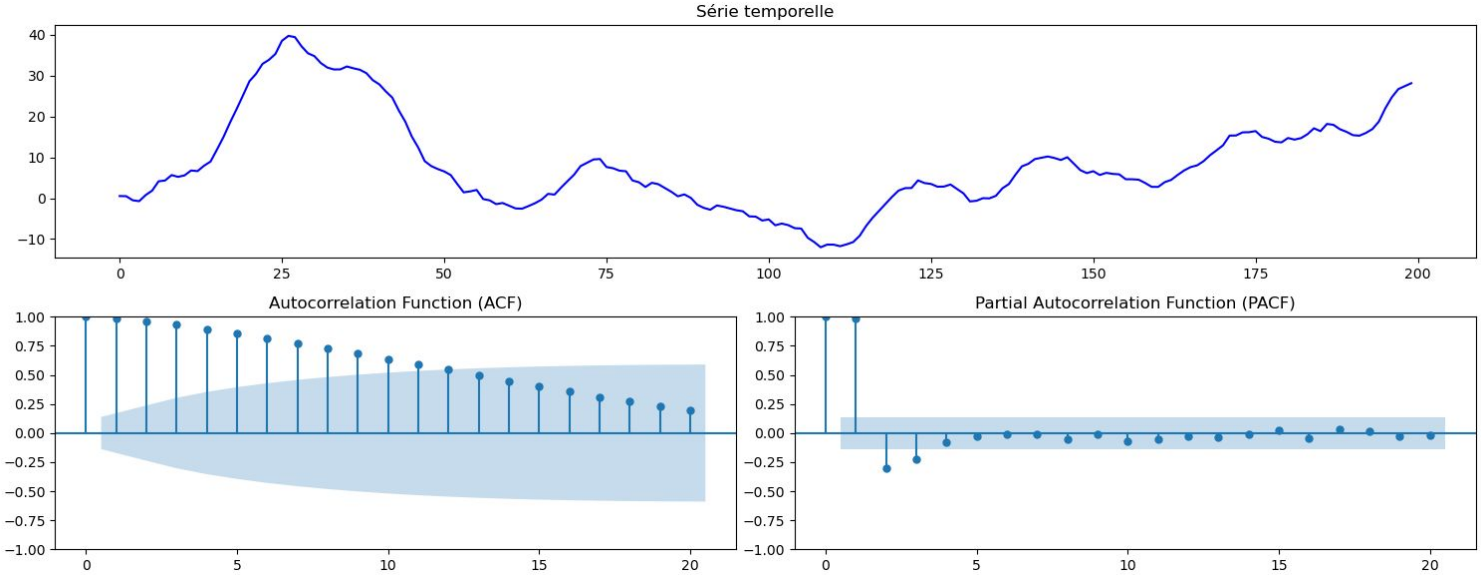




- Cutoff acf au premier lag
- Déclin progressif PACF

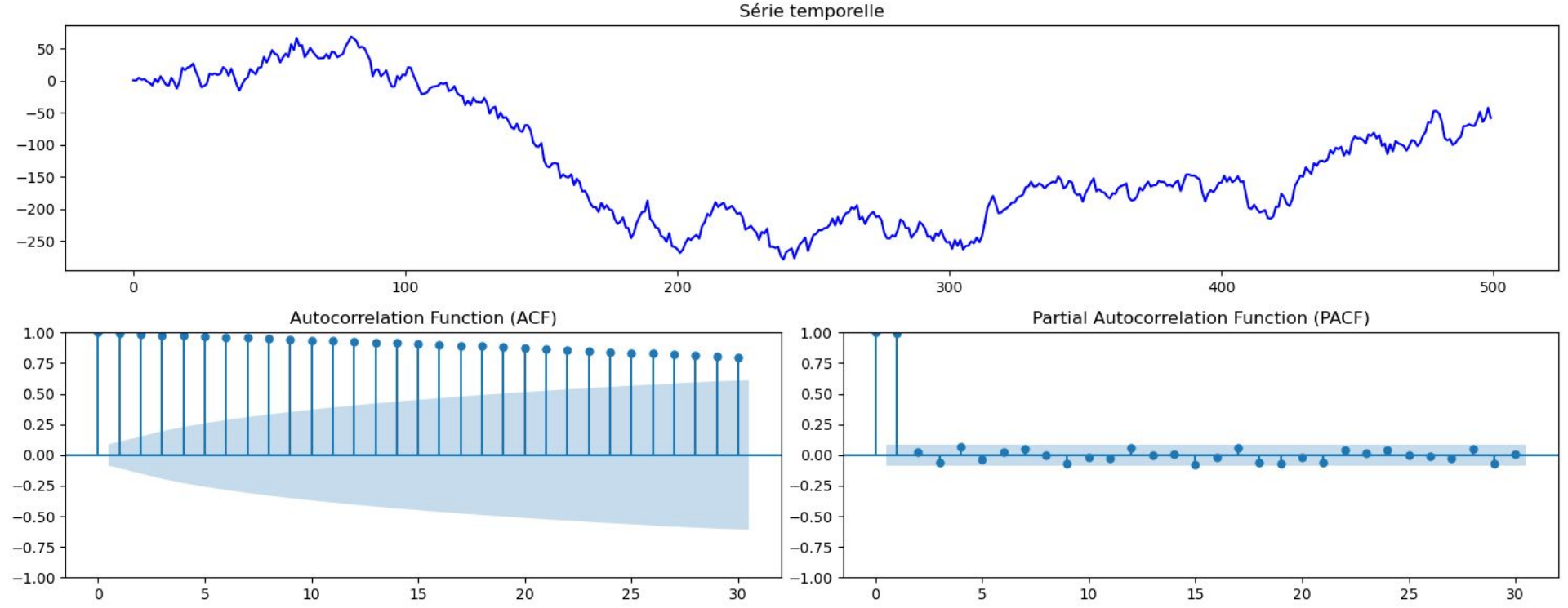
>>> MA(1)

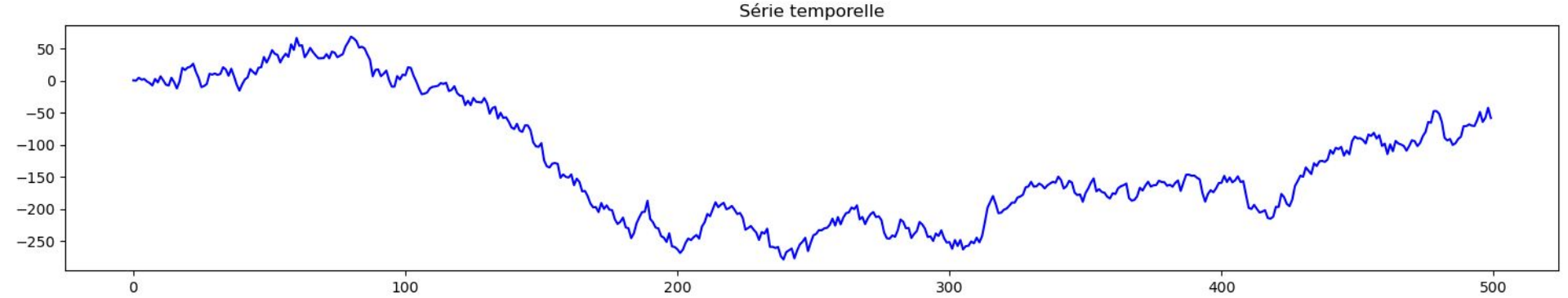

Série temporelle
40
30
20
10
0
−10
0
25
50
75
100
125
150
175
200
Autocorrelation Function (ACF)
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0
5
10
15
20
Partial Autocorrelation Function (PACF)
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0
5
10
15
20

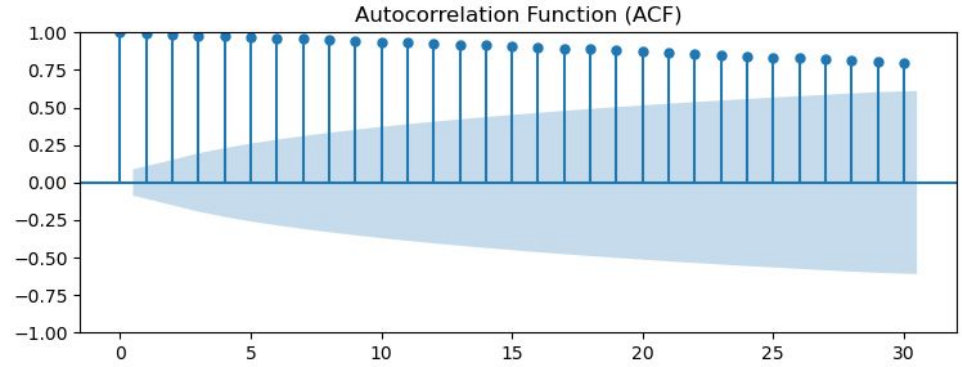


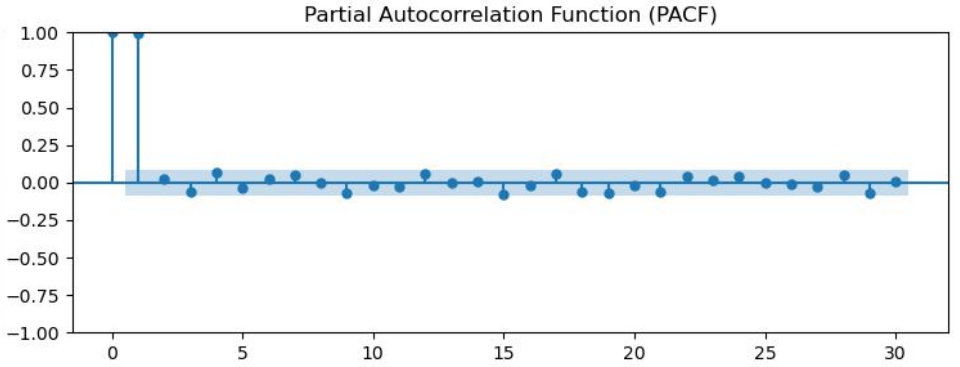
- Série non stationnaire, confirmé par le ACF qui n'atteint pas 0
- Cutoff des pacf à 3

>>> ARIMA(3, 1, 0)


Série temporelle
50
0
−50
−100
−150
−200
−250
0
100
200
300
400
500
Autocorrelation Function (ACF)
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0
5
10
15
20
25
30
Partial Autocorrelation Function (PACF)
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0
5
10
15
20
25
30

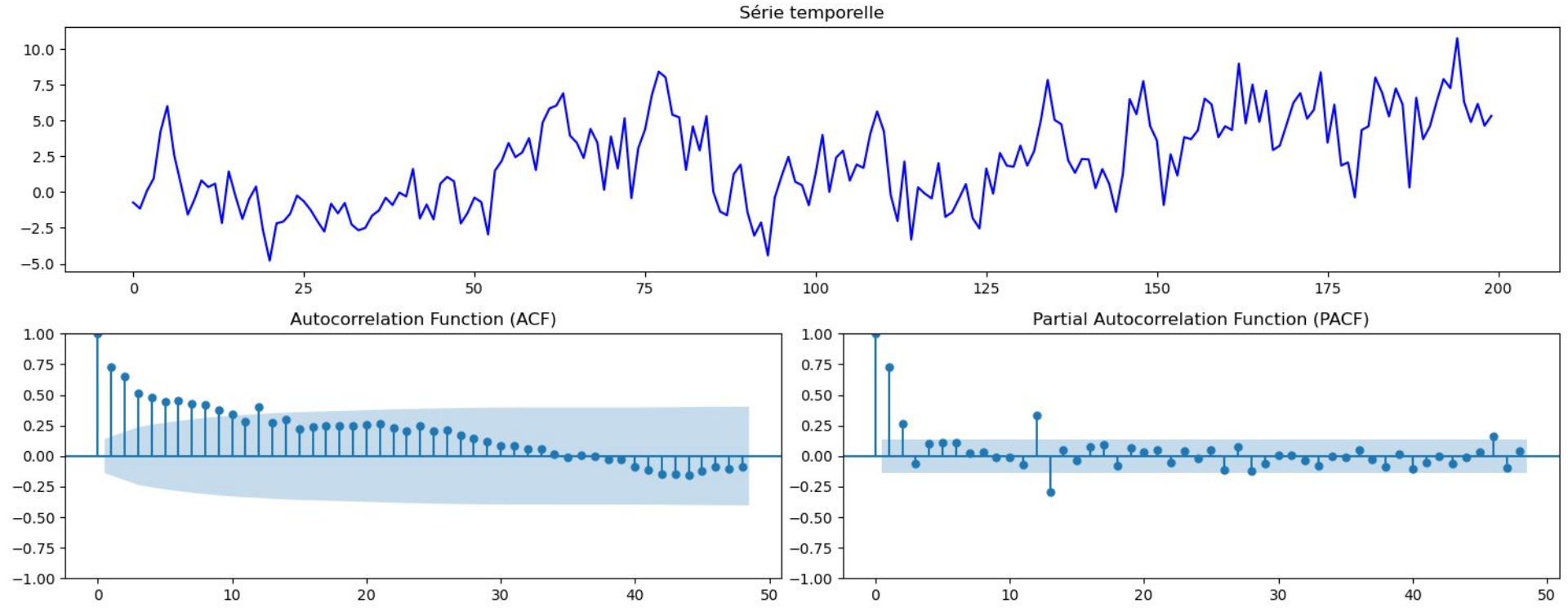


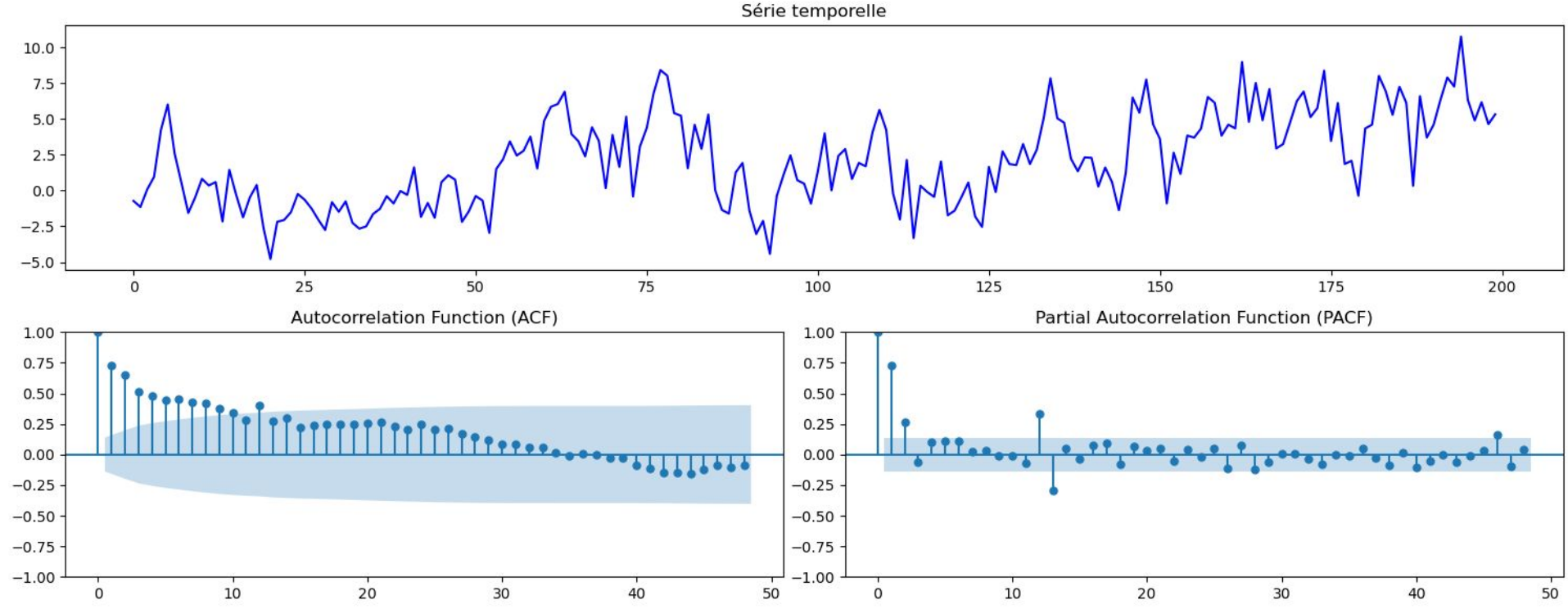




- Pas de decay des ACF
- Cutoff PACF à 1

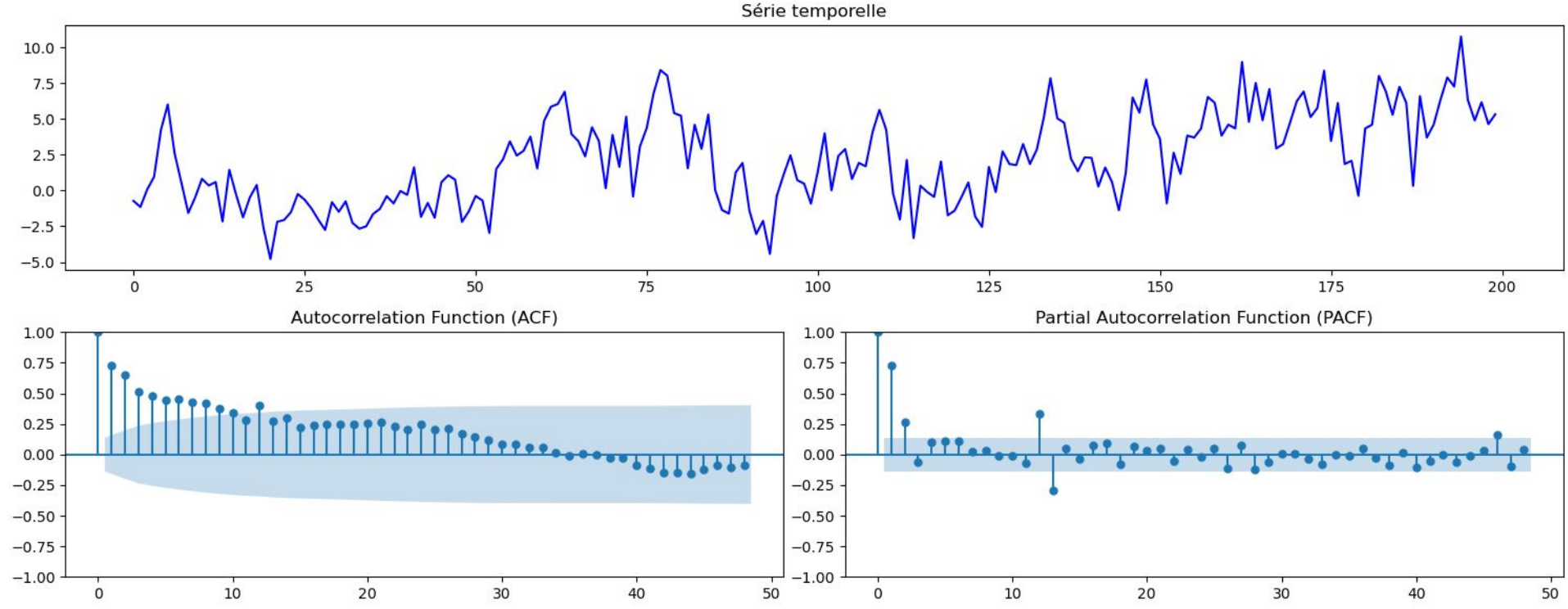
>> ARIMA(1, 1, 0) ??


Série temporelle
Autocorrelation Function (ACF)
Partial Autocorrelation Function (PACF)



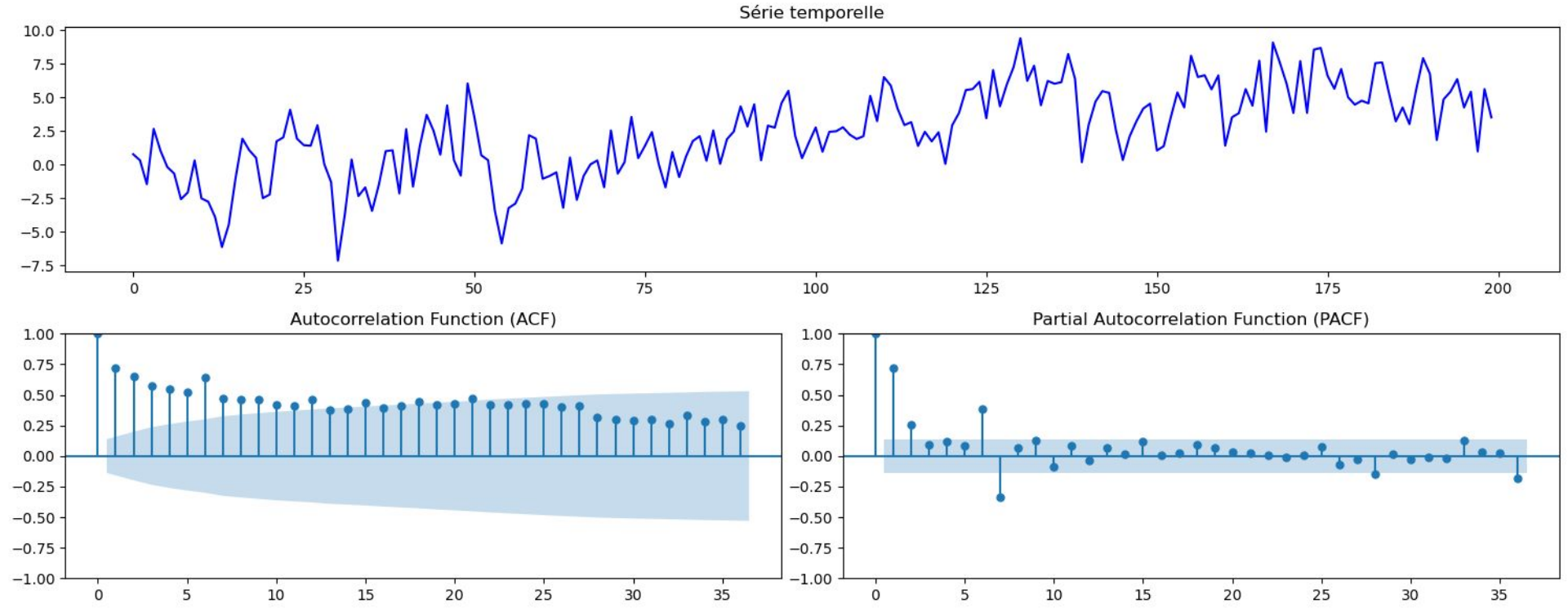
- Décroissance progressive des ACF mais avec une régularité : pic tous les mulitples de 12
- Cutoff PACF au lag 2 mais pics tous les multiples de 12

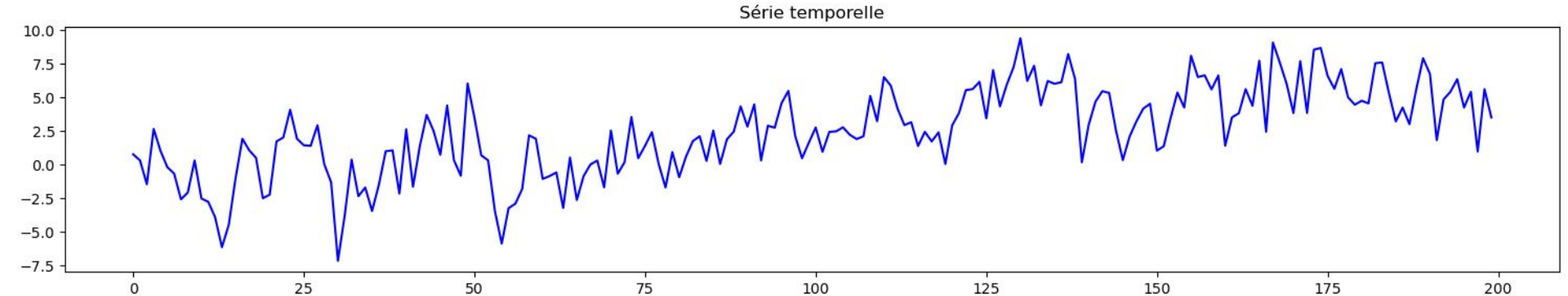
>>> SARIMA(0,0,0)(2, 0, 0, 12)

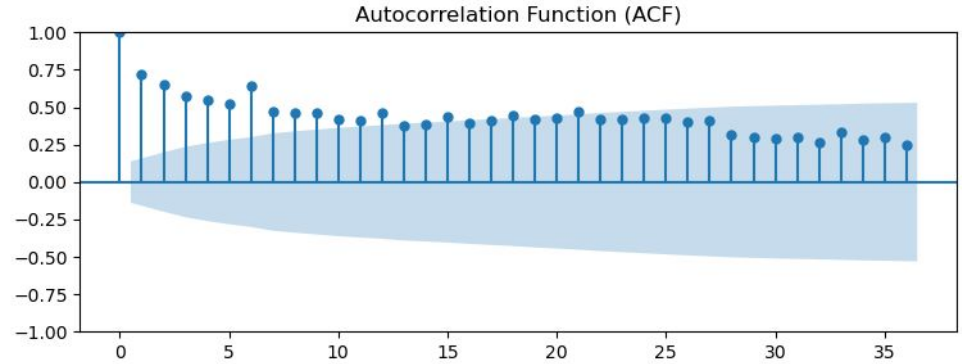


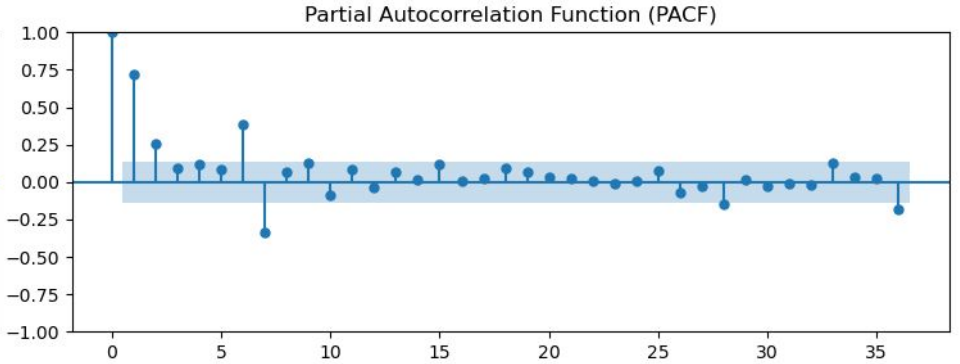
- Décroissance progressive des ACF mais avec une régularité : pic tous les mulitples de 12
- Cutoff PACF au lag 2 mais pics tous les multiples de 12

>>> SARIMA(0,0,0)(2, 0, 0, 12)


Série temporelle
Autocorrelation Function (ACF)
Partial Autocorrelation Function (PACF)



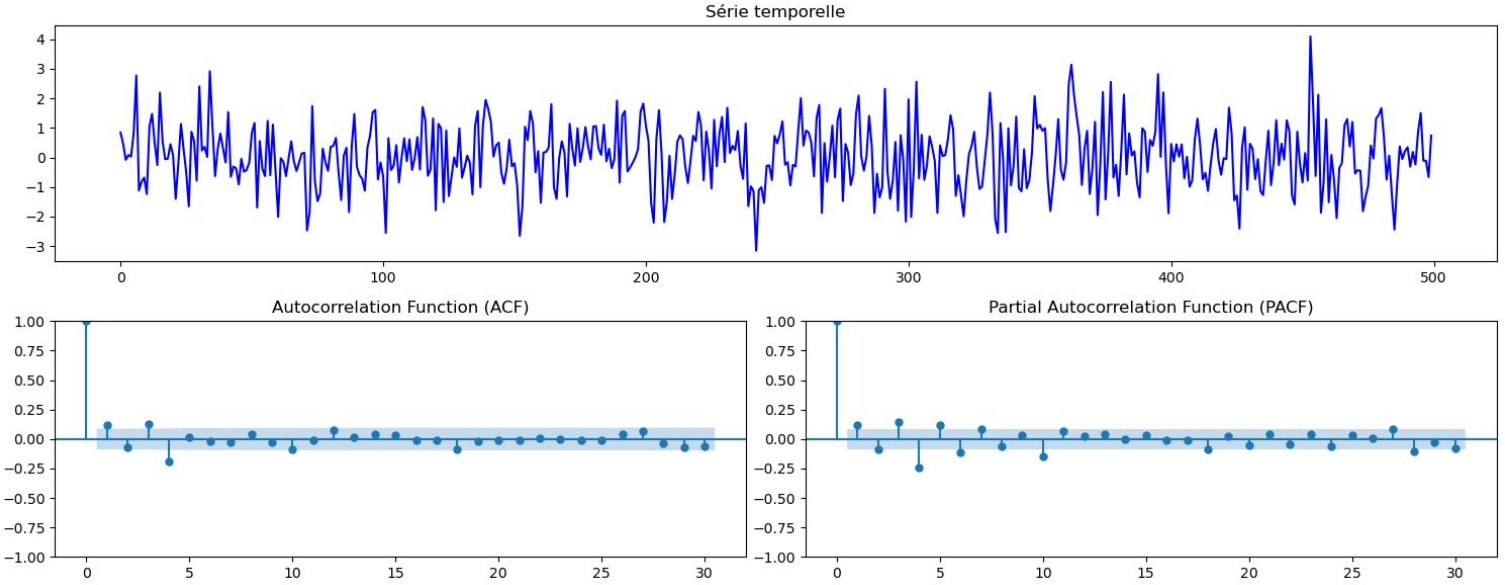




Périodicité de 6

CAVEATS

- Les diagnostics des ACF / PACF ne sont pas une formule magique : bien souvent, les corrélogrammes sont ambivalents (bruit statistique)



CAVEATS

- Les diagnostics des ACF / PACF ne sont pas une formule magique : bien souvent, les corrélogrammes sont ambivalents (bruit statistique)
- En pratique, ils donnent une idée générale des modèles qui pourraient convenir et on en teste plusieurs que l'on compare

  - En grid searchant les hyperparamètres (*p, d, q*) par exemple
  - En les comparant sur la base d'un score RMSE / R^2 par exemple ou avec des critères d'informations (AIC / BIC)