

COMPRESSION SUPERPIXELS

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PLAN

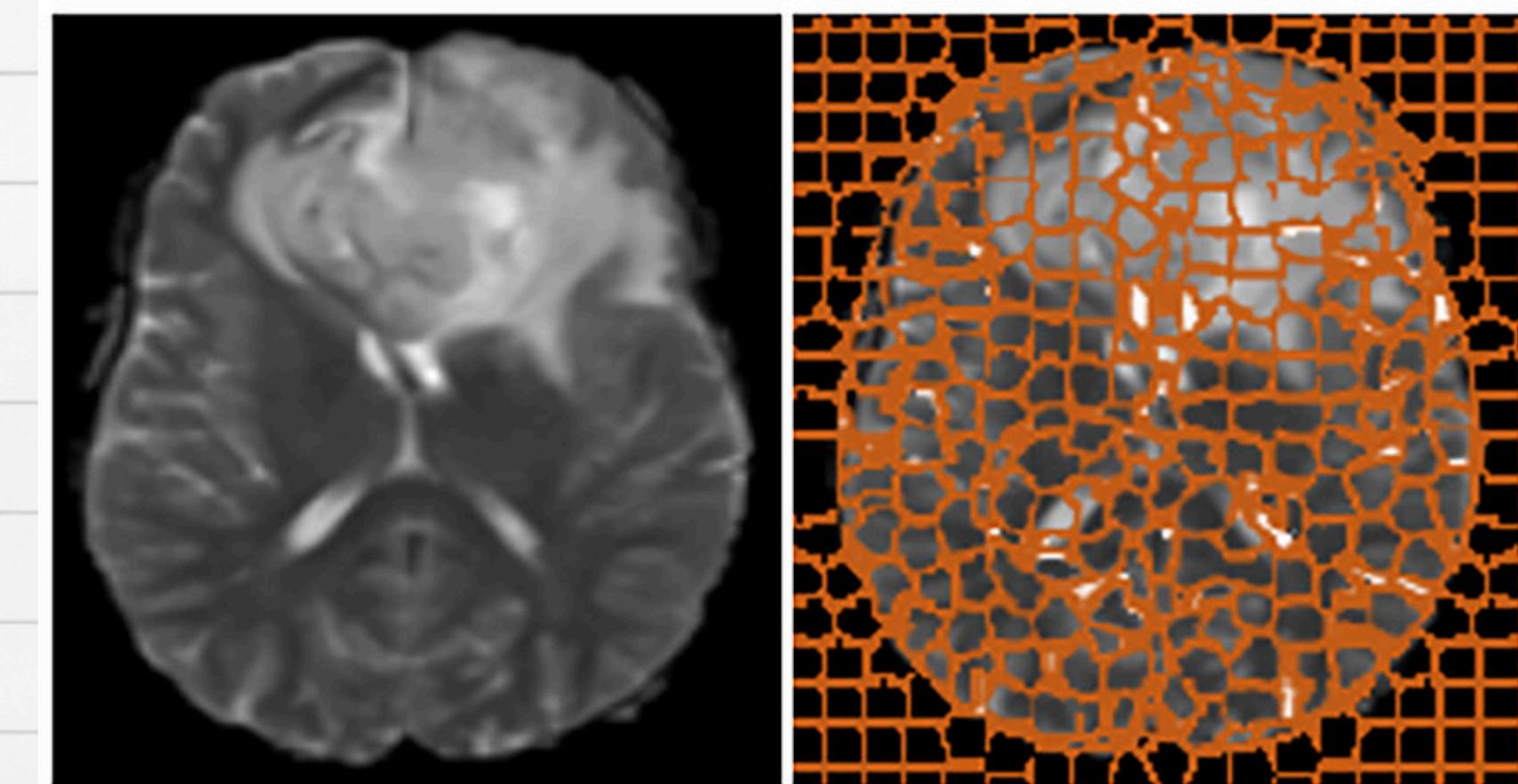
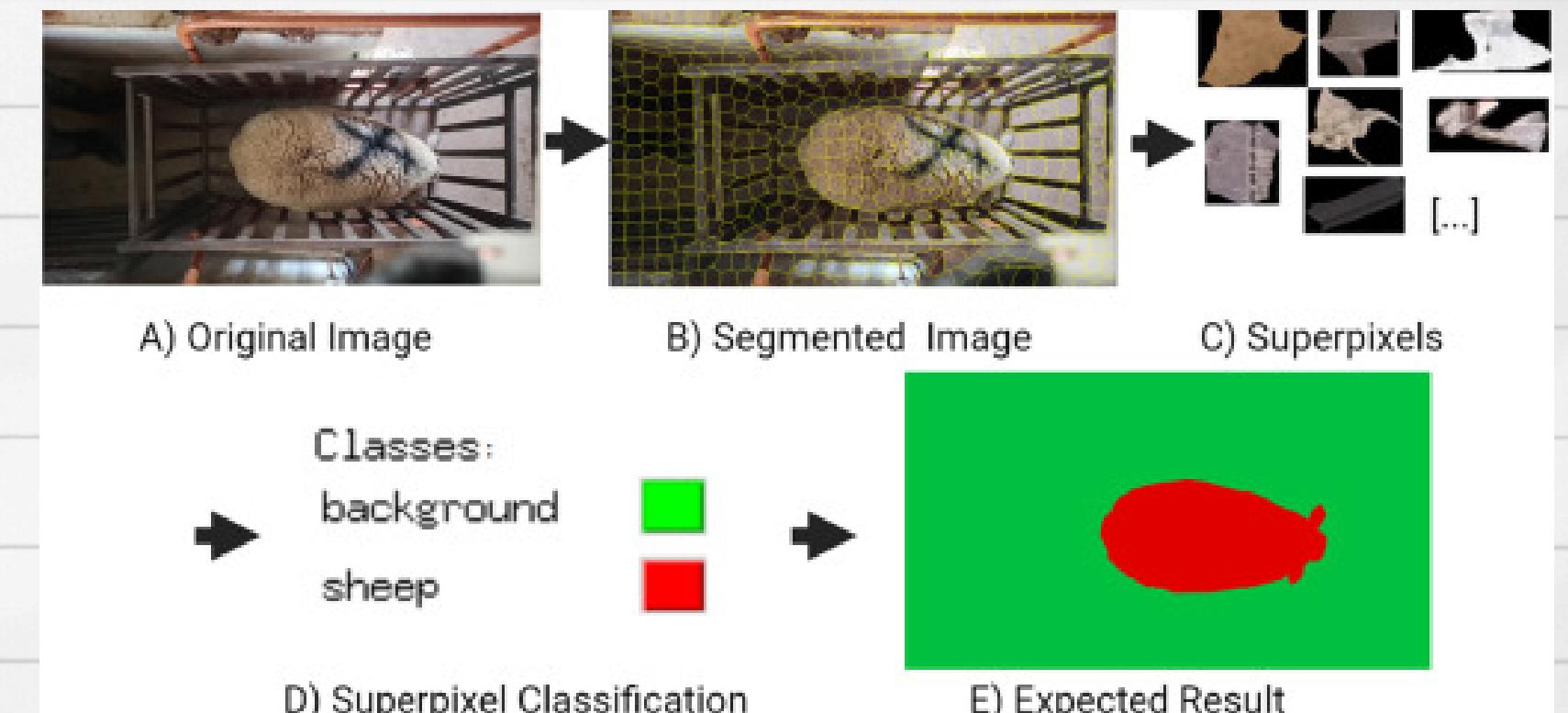
- Applications
- Etat de l'art
- SLIC
- Watershed
- Sondage
- Démonstration

APPLICATIONS

Vision par ordinateur et détection d'objets

Segmentation d'images médicales

Compression d'images



ETAT DE L'ART

Méthodes basées sur les graphes :

GraphCut

Normalized Cuts

Méthodes par clustering :

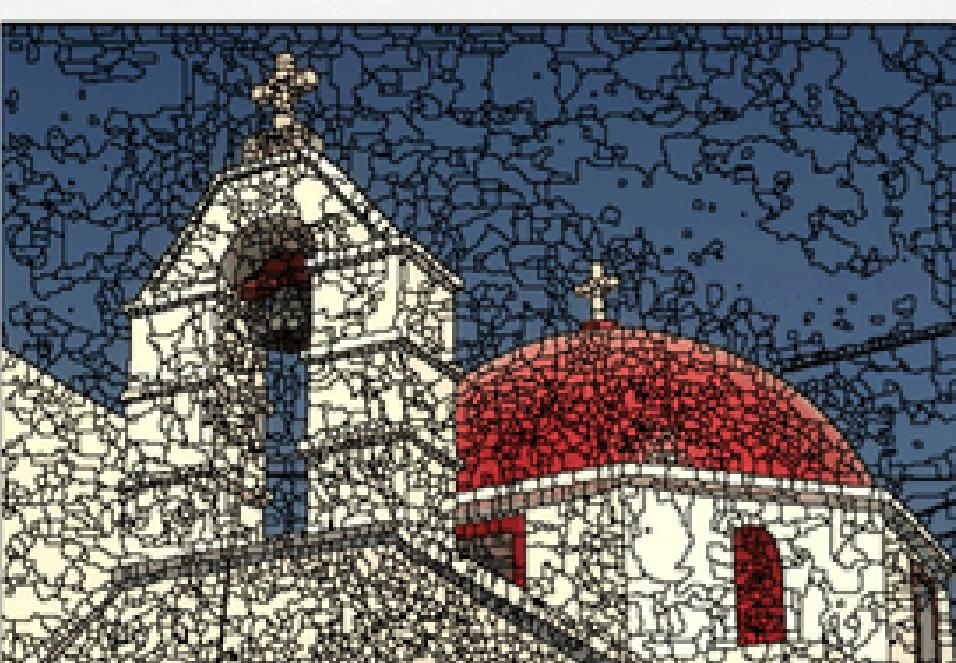
SLIC

SEEDS

Méthodes basées sur les gradients :

WaterShed

TurboPixels



SLIC

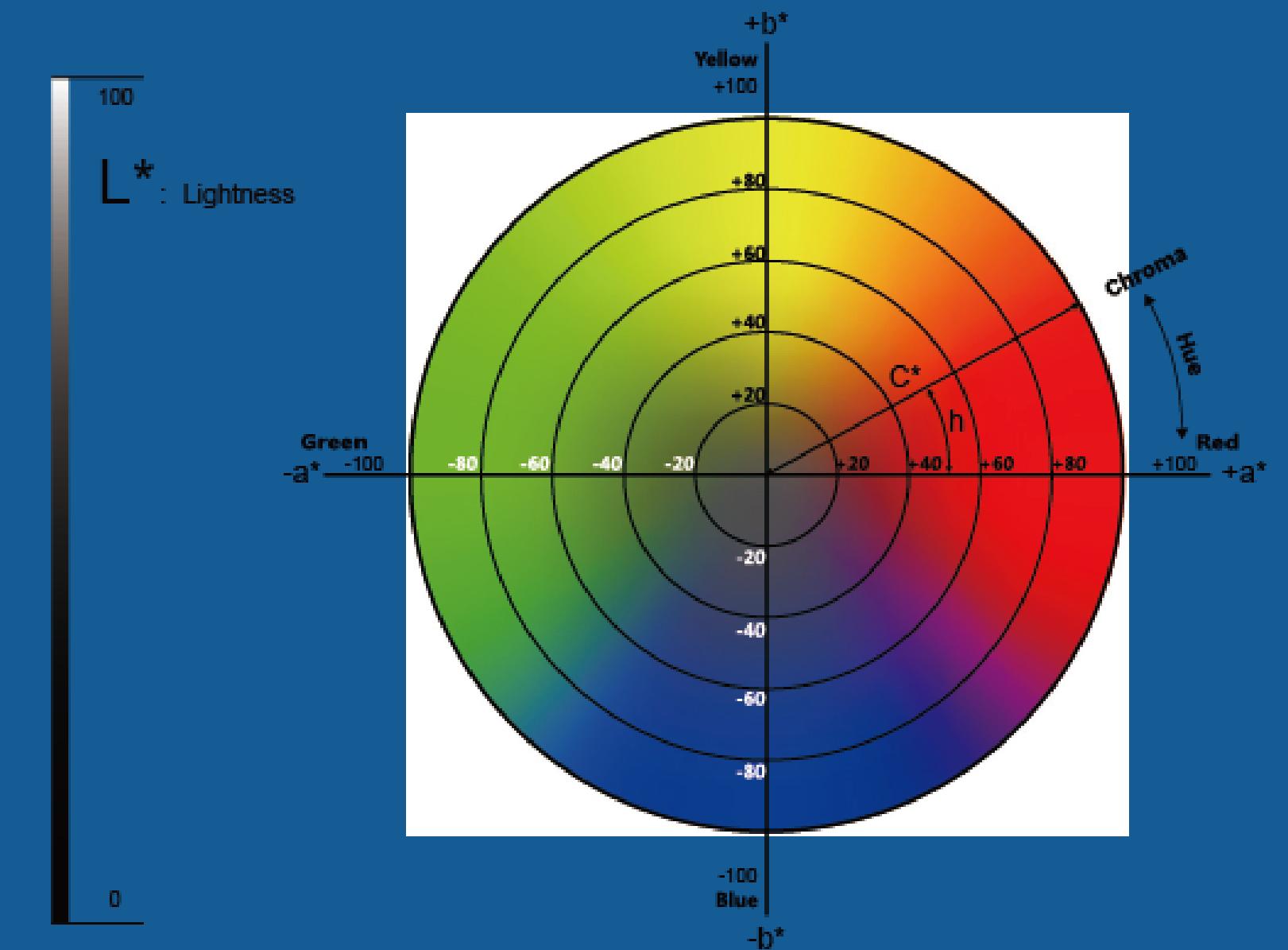
[SIMPLE LINEAR ITERATIVE CLUSTERING]

Achanta, R., Shaji, A., Smith, K., Lucchi, A., Fua, P., & Süsstrunk, S. (2010) “Slic superpixels”

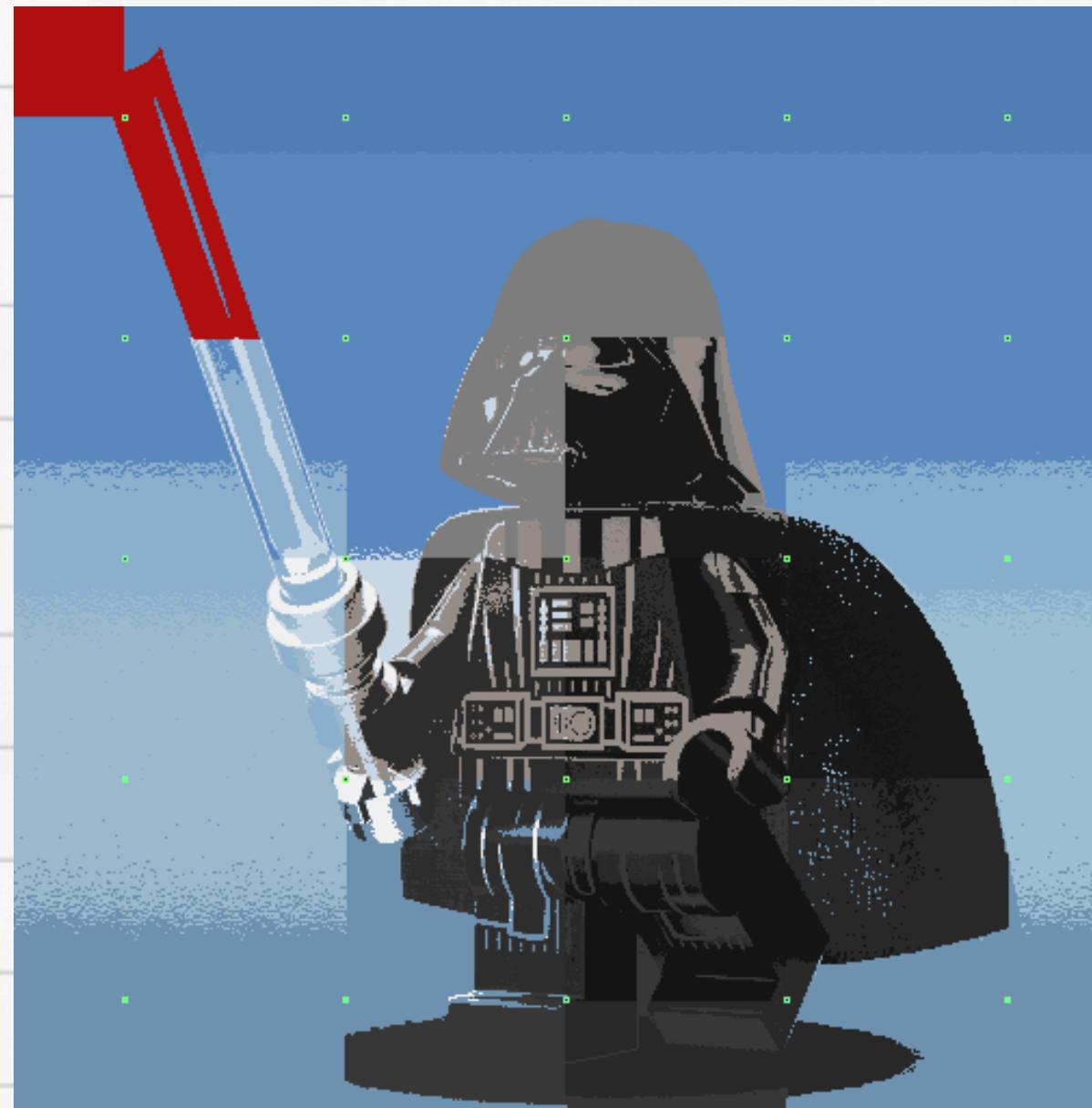
Distance calculée dans un **espace 5D** avec la couleur CIELAB et la position (x,y)

Avantage : une bonne qualité et un paramétrage facile

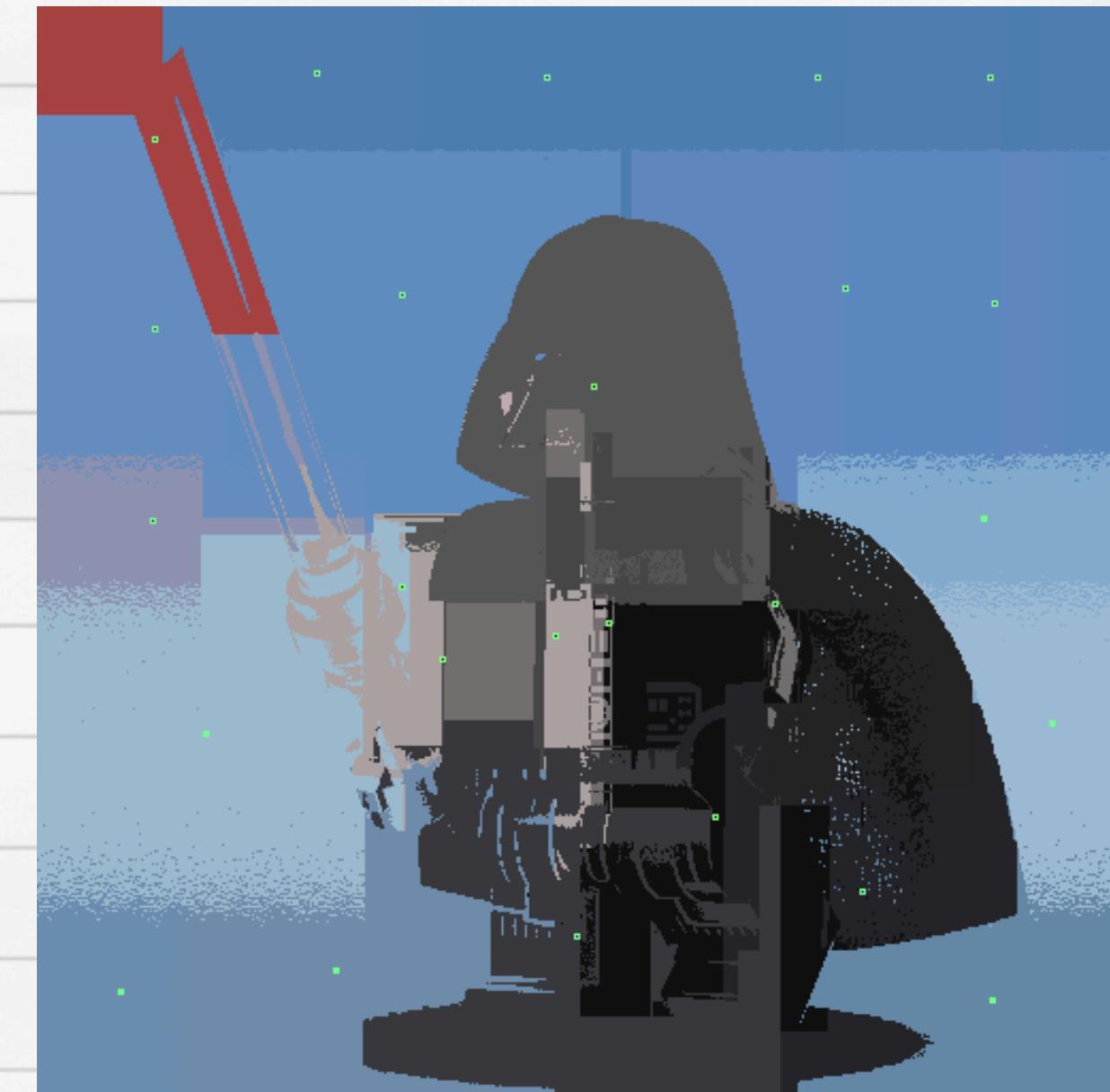
Inconvénient : coût de calcul important



SLIC



25 superpixels
position initiale



25 superpixels
1 itération

SLIC



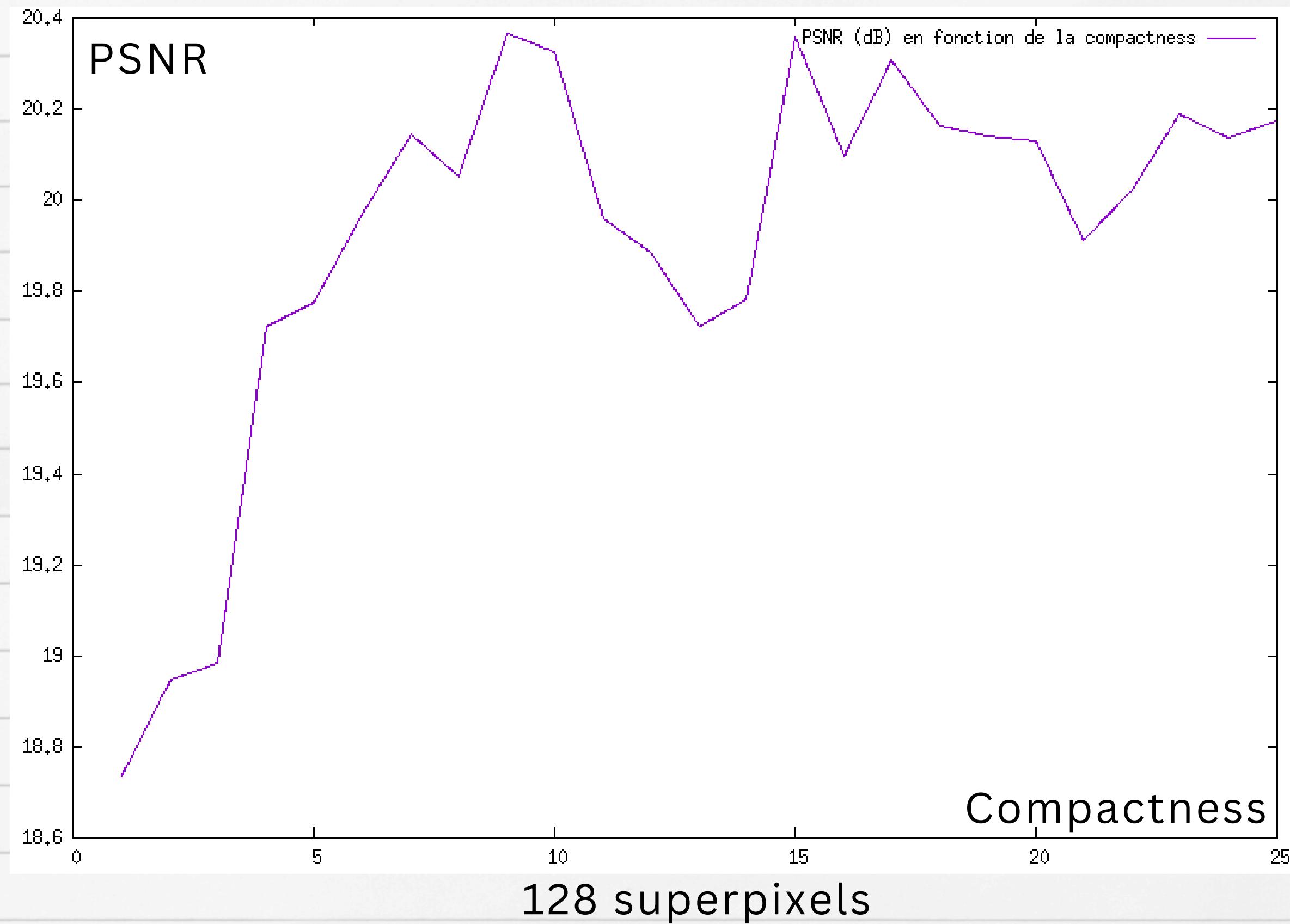
Image de base

100 superpixels
 $m=20$

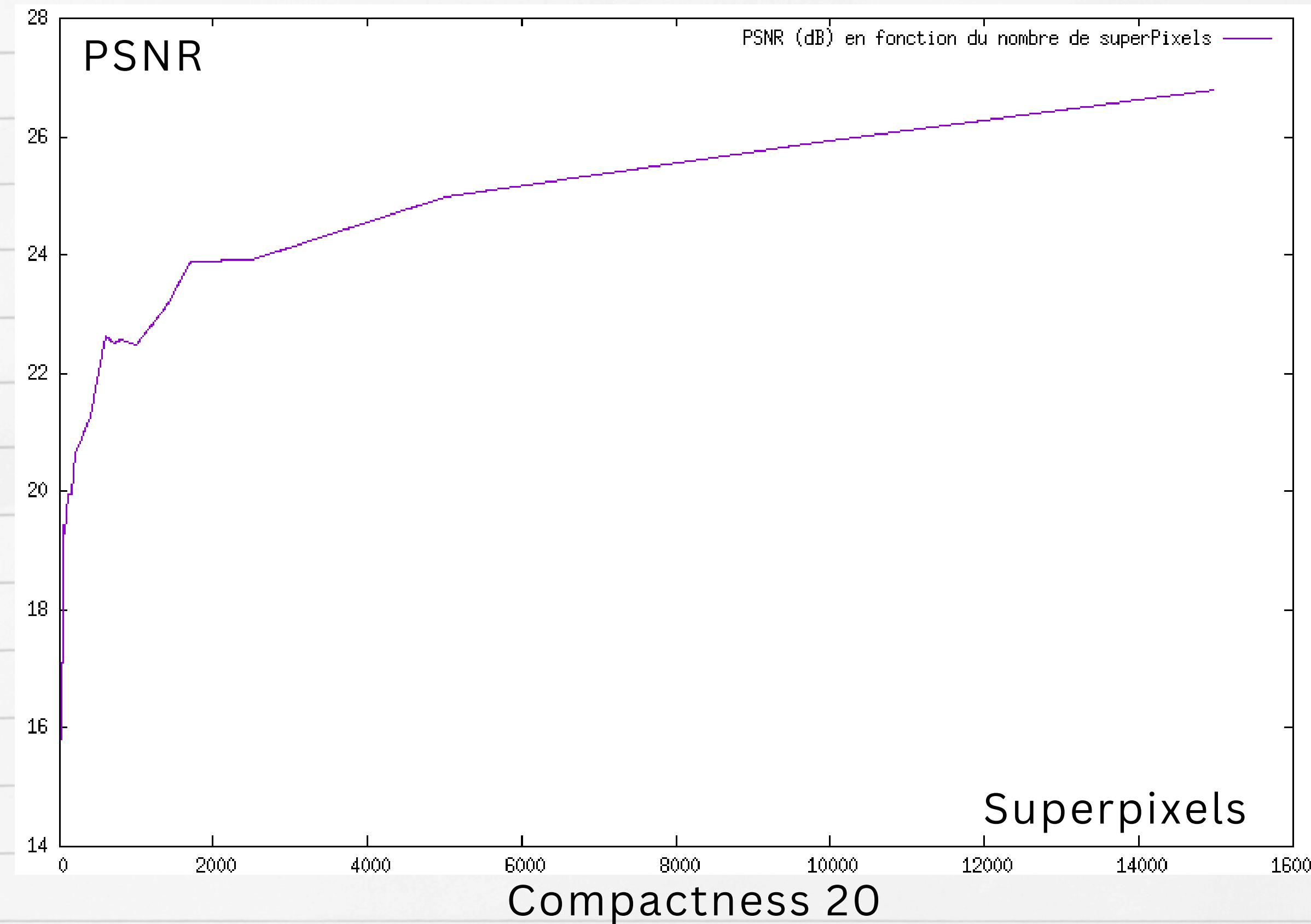
1000 superpixels
 $m=20$

5000 superpixels
 $m=20$

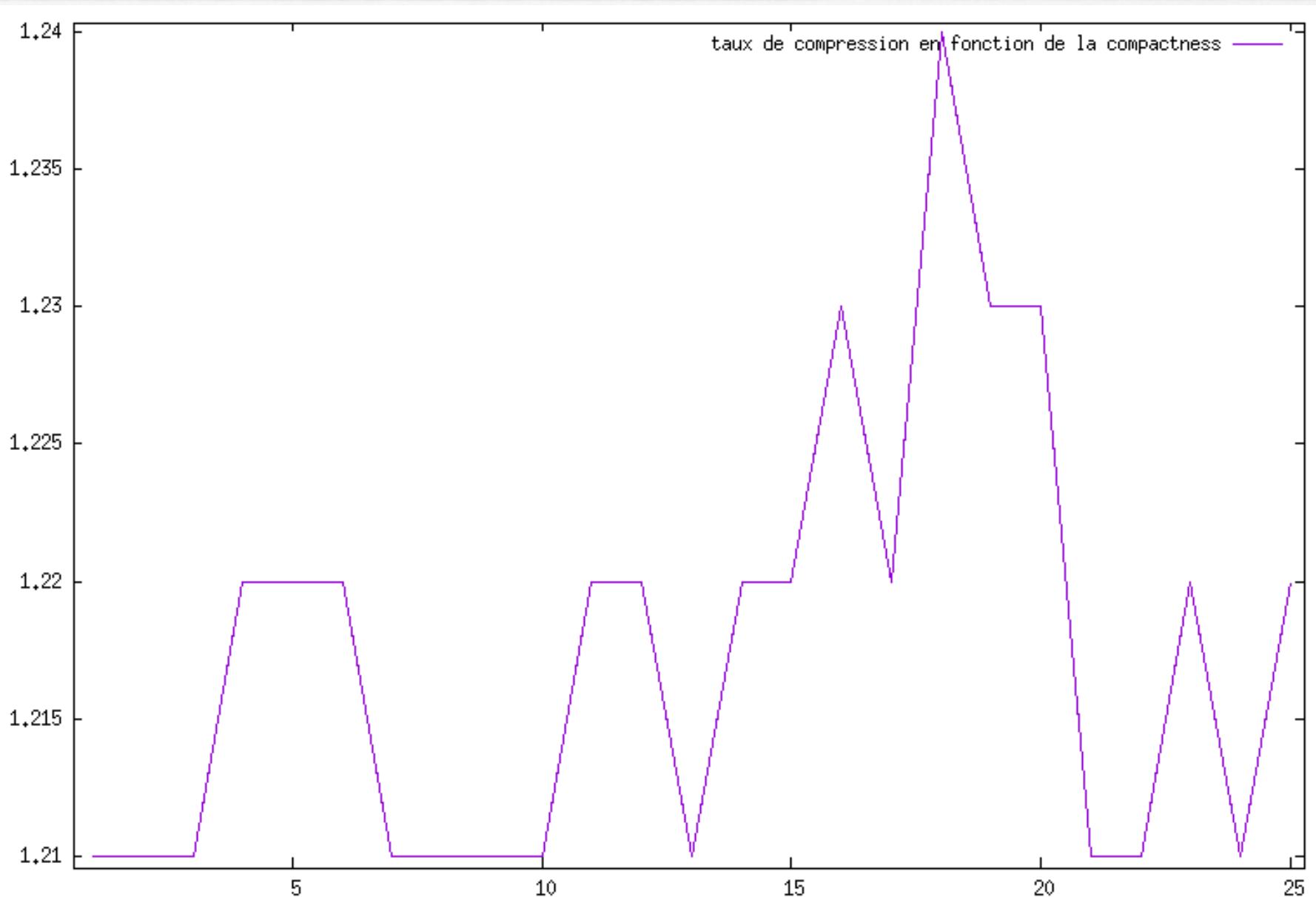
COMPRESSION



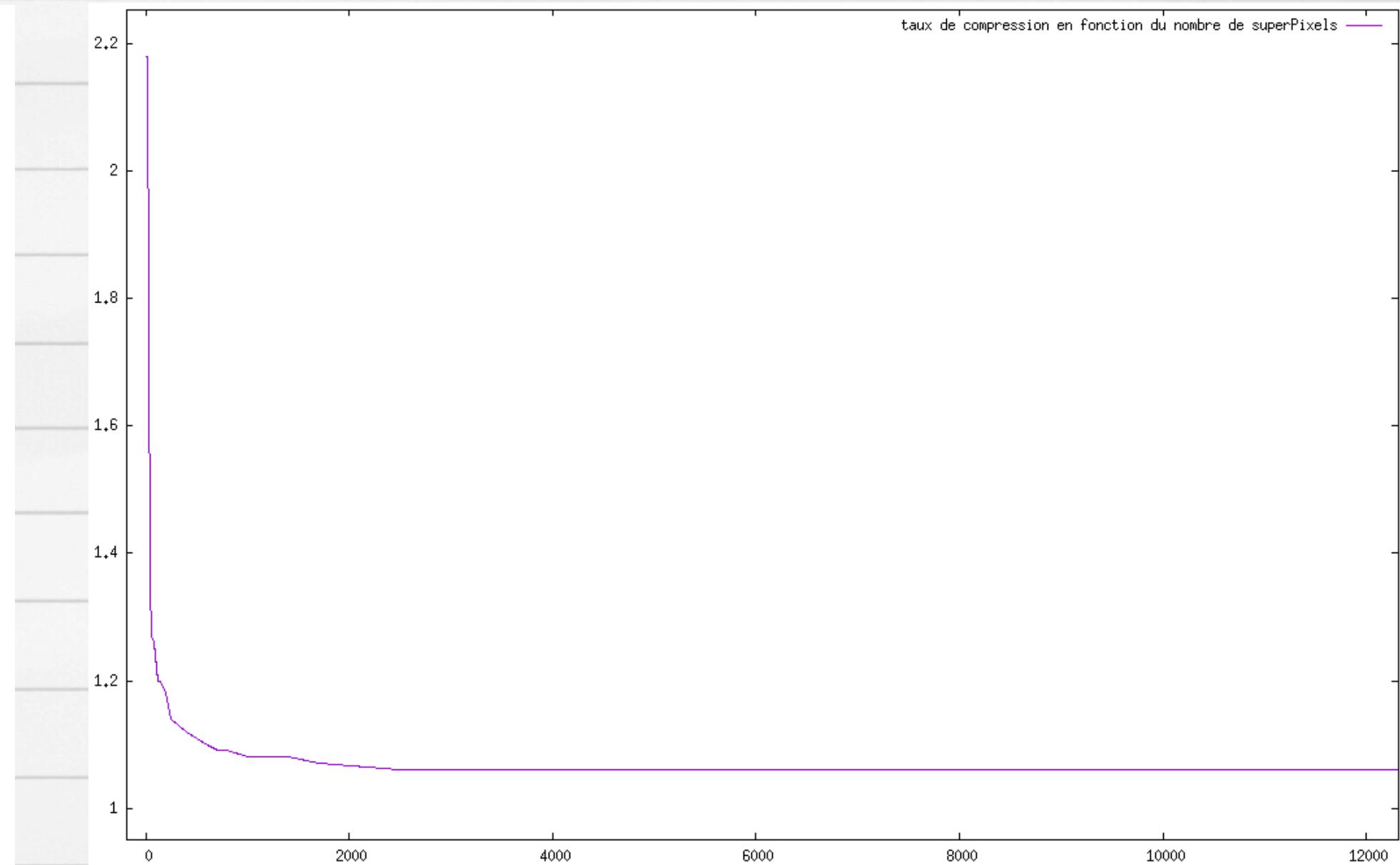
COMPRESSION



COMPRESSION



Huffman
128 superpixels



Huffman
compactness 20

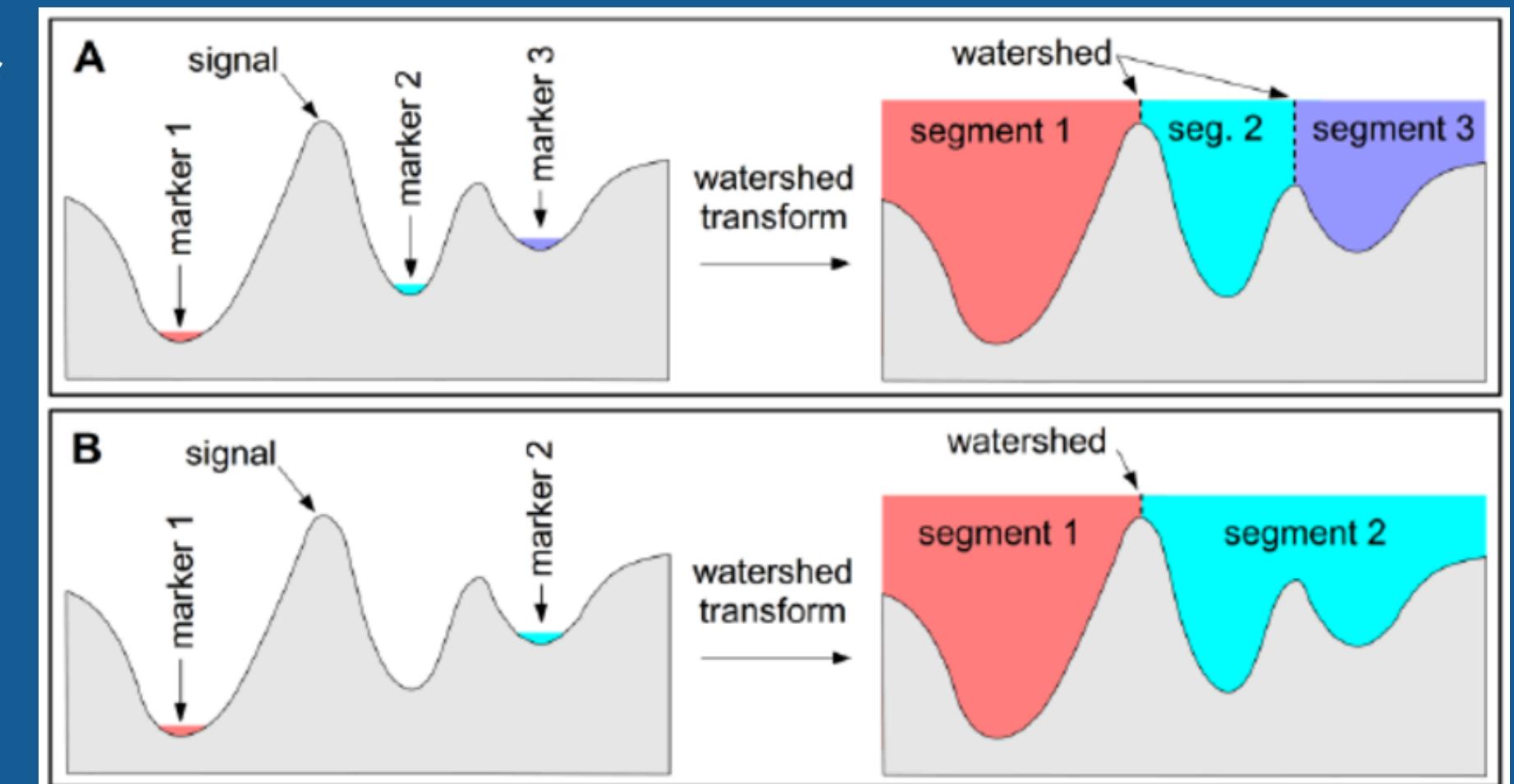
WATERSHED

Z. Hu, Q. Zou and Q. Li, (2015)
“Watershed superpixel”

Calcule des super pixels à partir du gradient en inondant une carte de relief

Avantage : rapide et offre une segmentation précise

Inconvénient : super pixels de tailles inégales



WATERSHED

1/16	1/8	1/16
1/8	1/4	1/8
1/16	1/8	1/16

-1	0	+1
-2	0	+2
-1	0	+1

Gx

+1	+2	+1
0	0	0
-1	-2	-1

Gy



WATERSHED



image de base

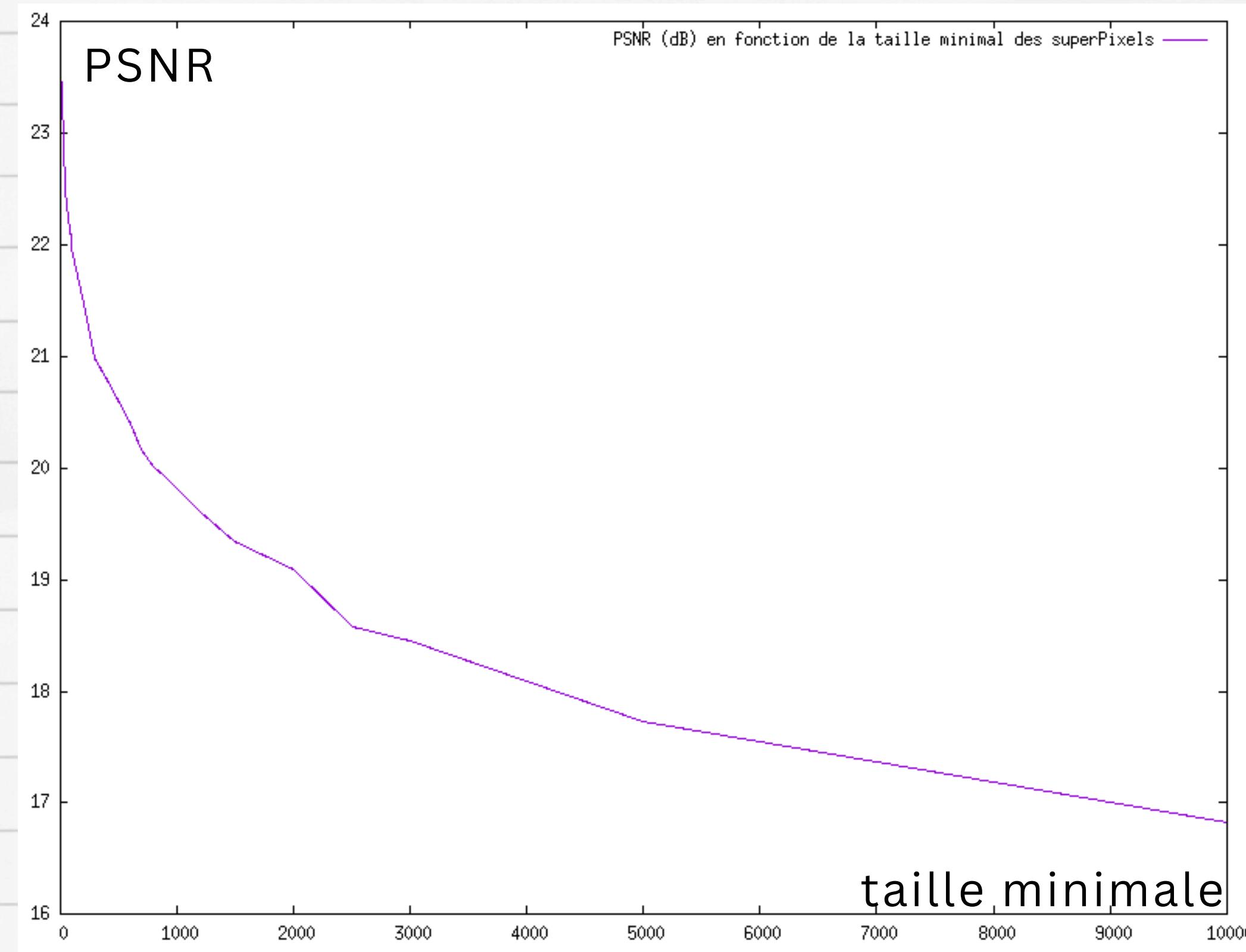


pas de minimum

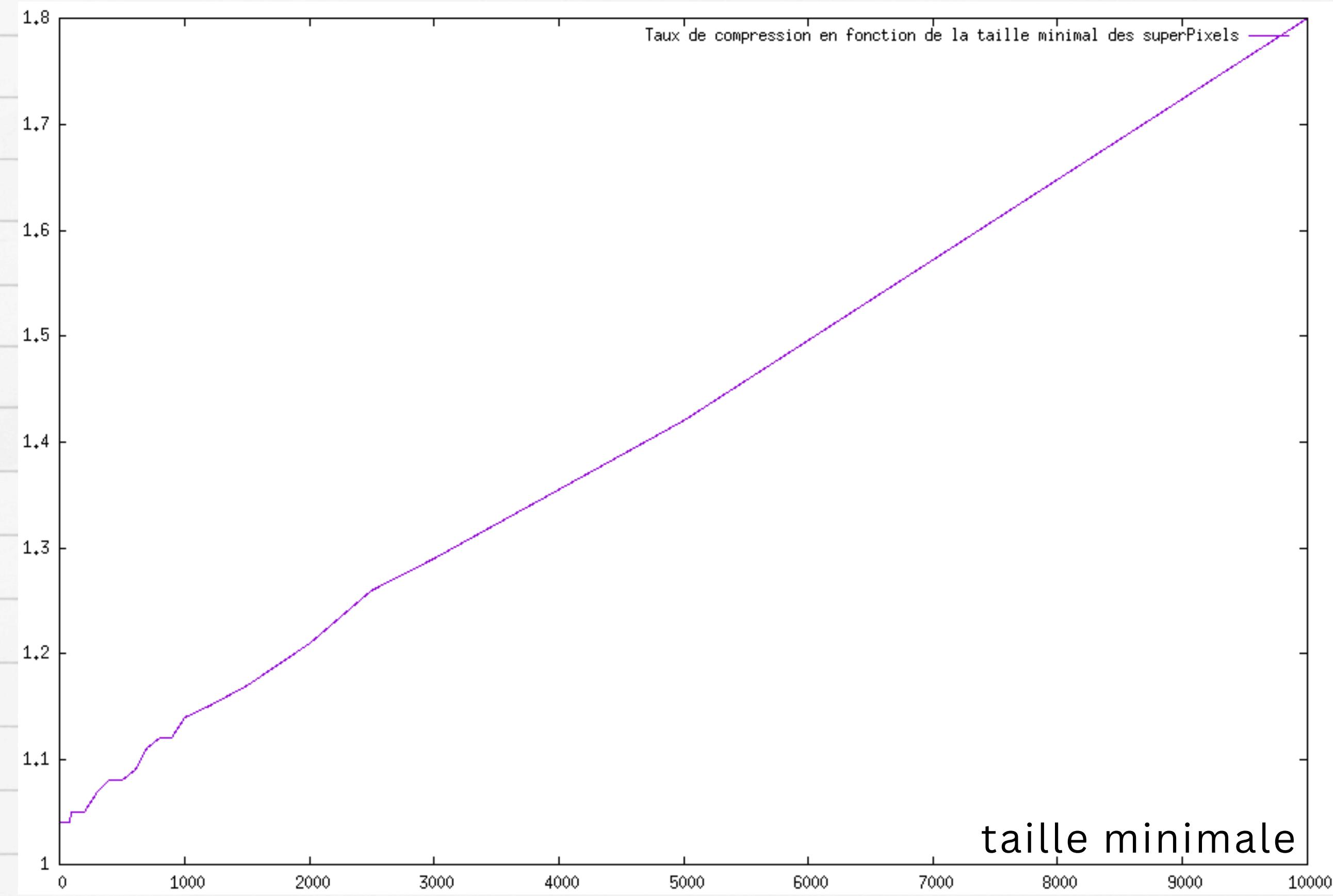


minimum à 1000

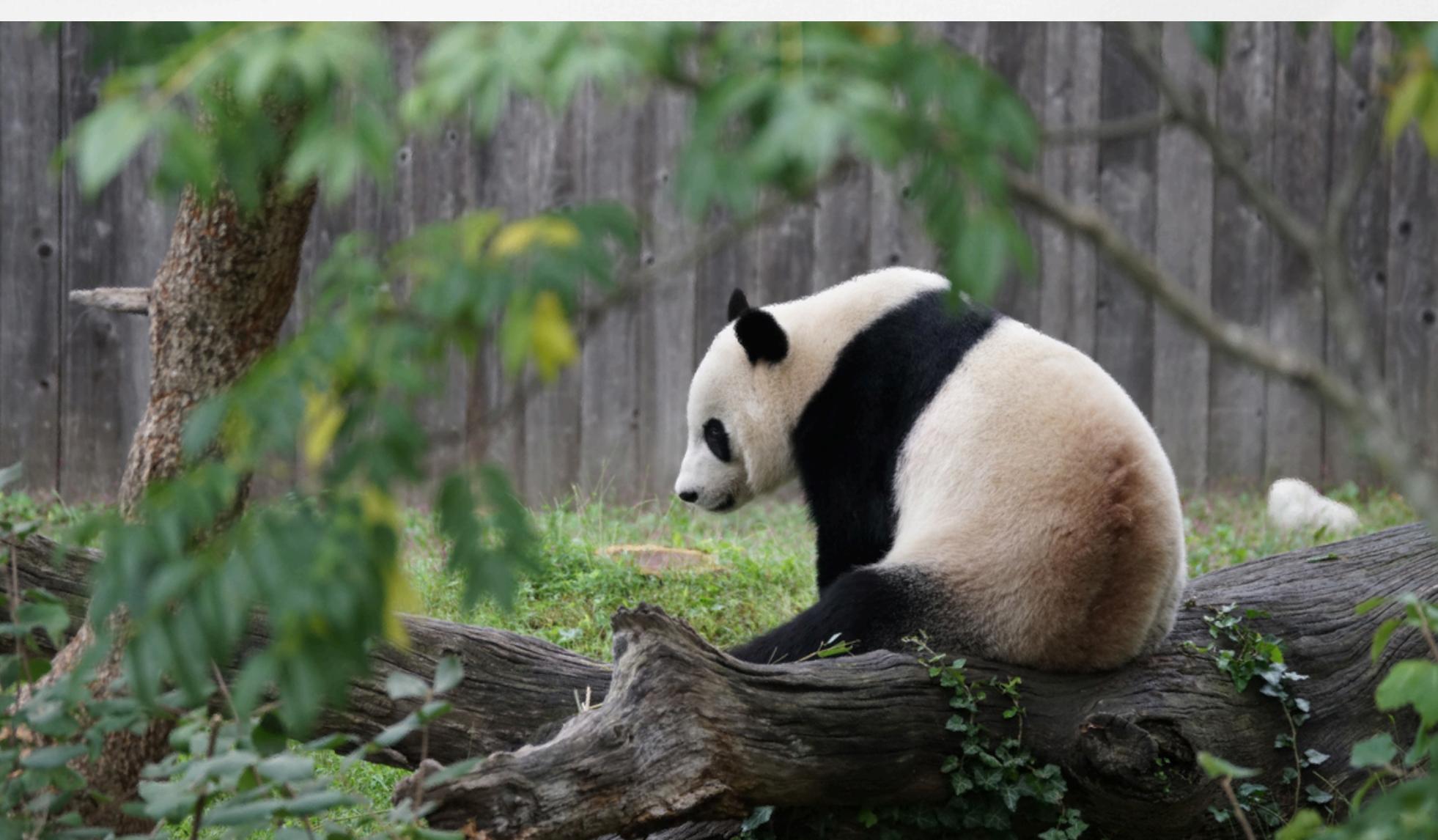
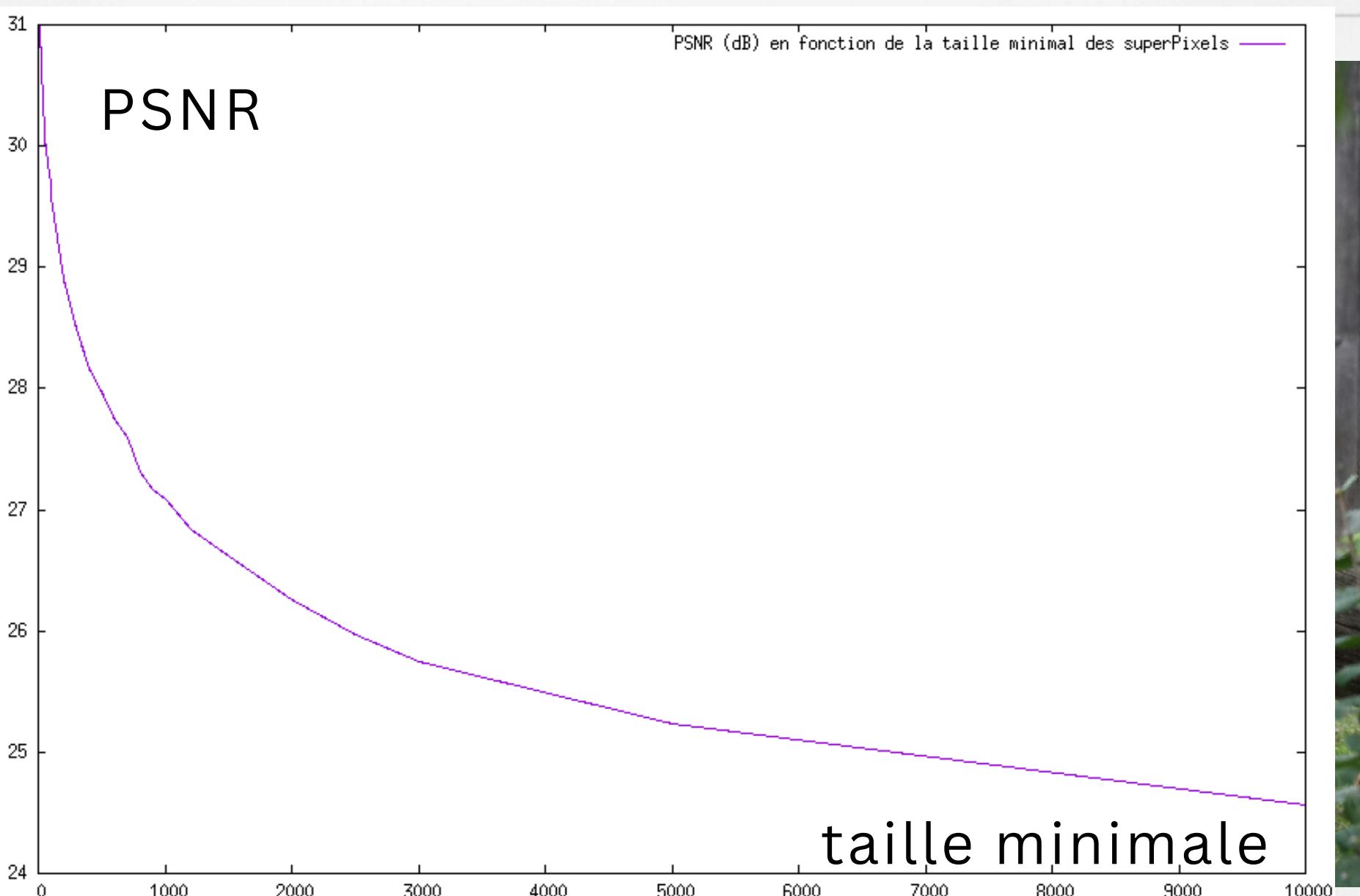
COMPRESSION



COMPRESSION



COMPRESSION



COMPARAISON

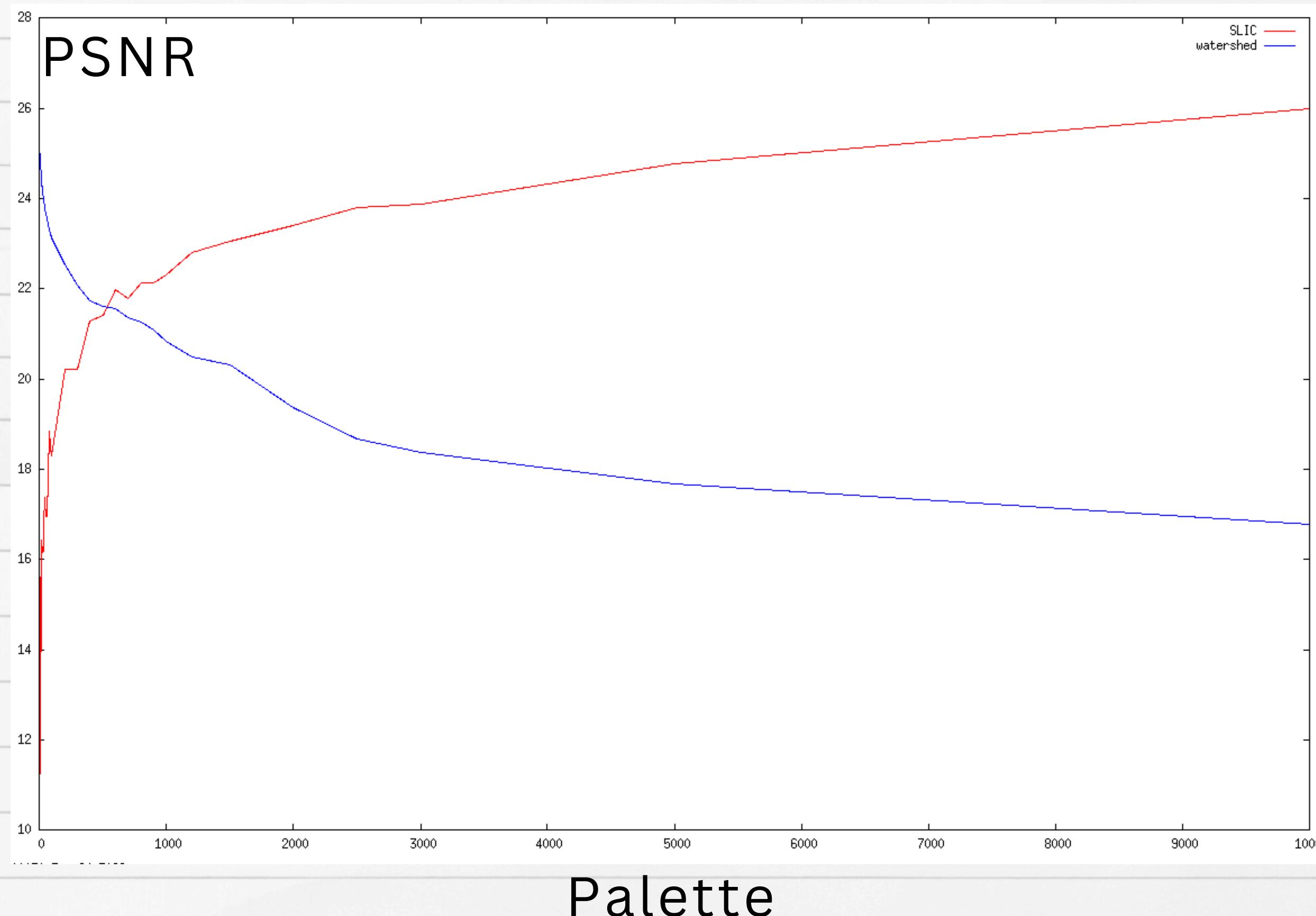


SLIC
5000 superpixels
compactness 20
PSNR: 25.00 dB

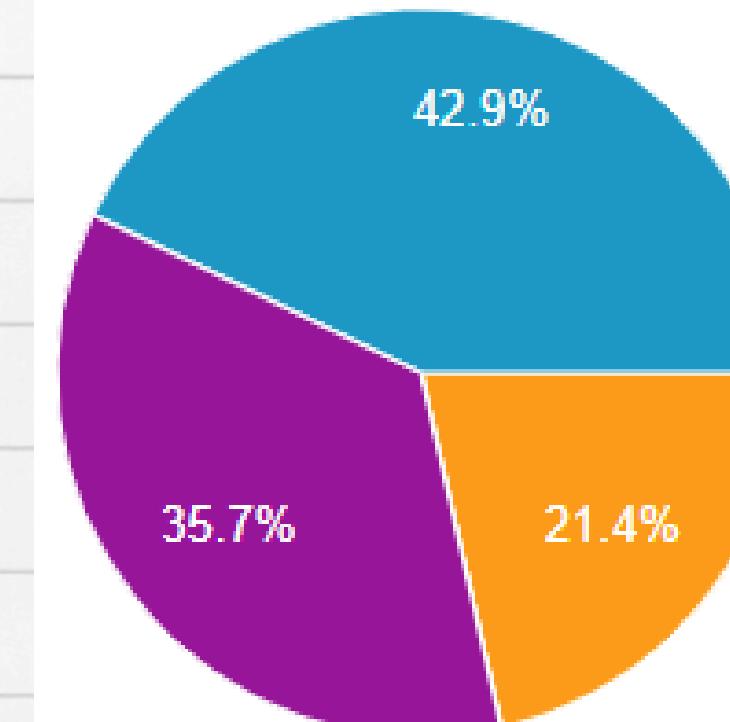
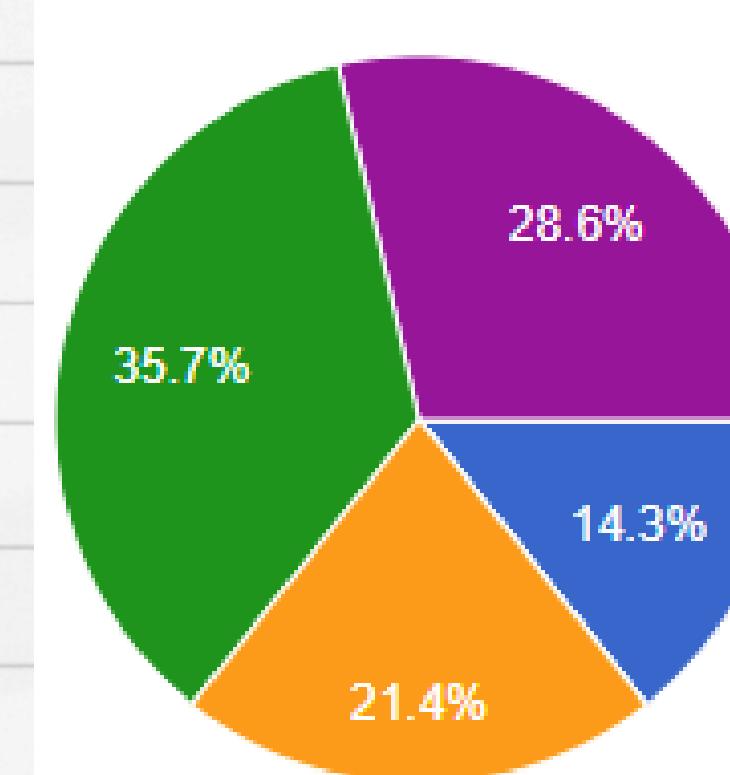
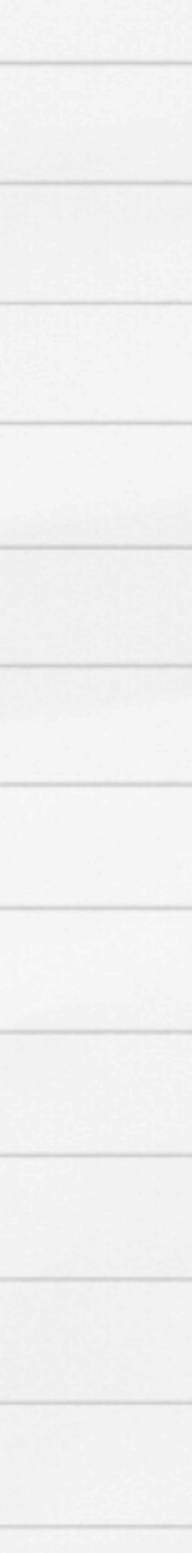
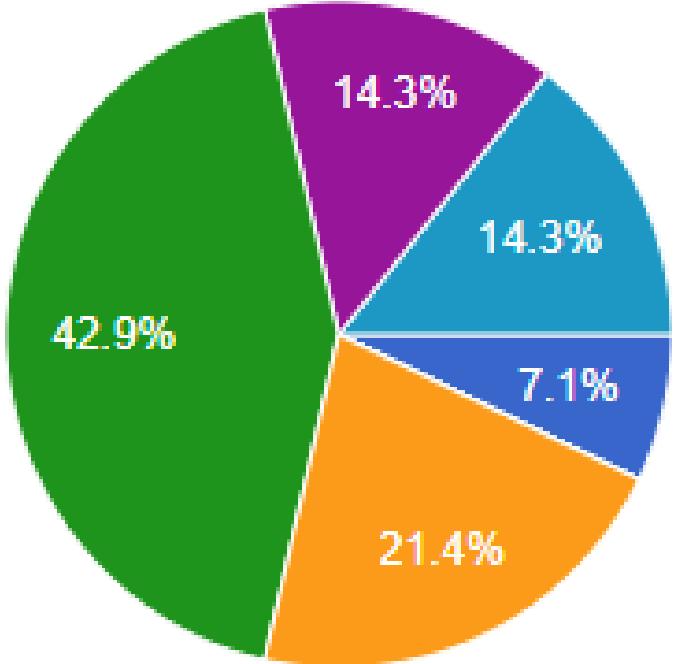
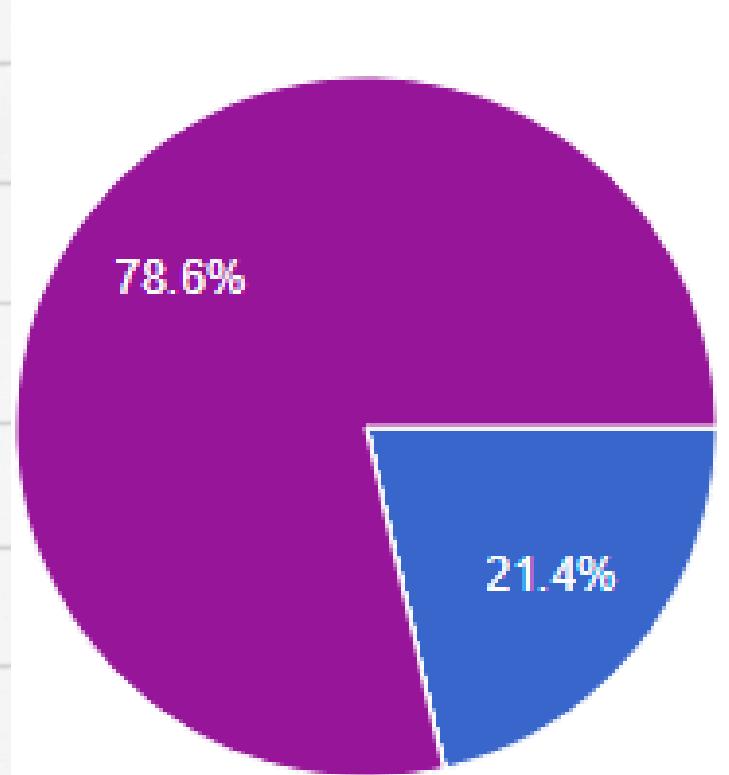


Watershed
sans taille minimum
PSNR: 25.34 dB

COMPARAISON

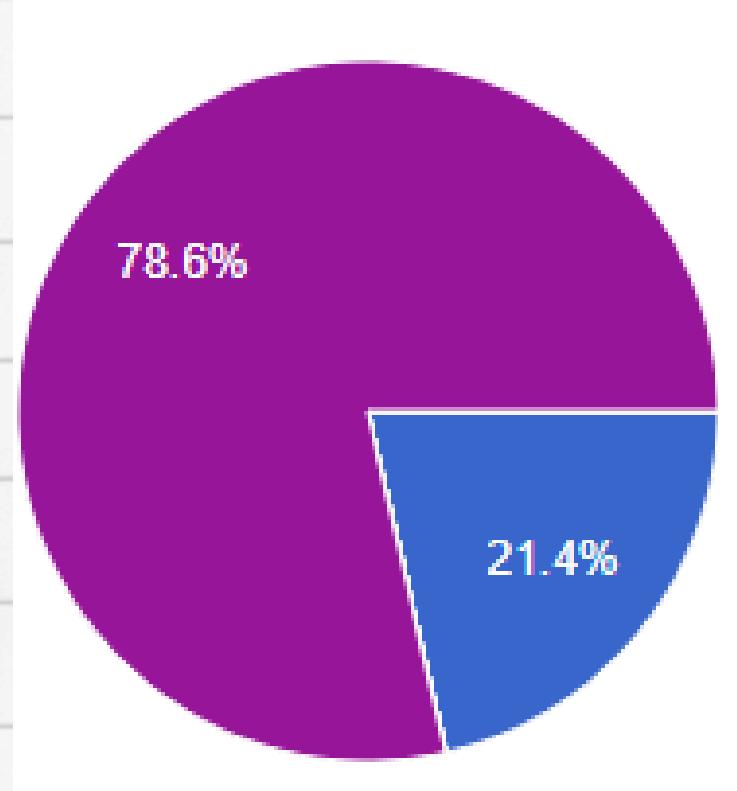


SONDAGE



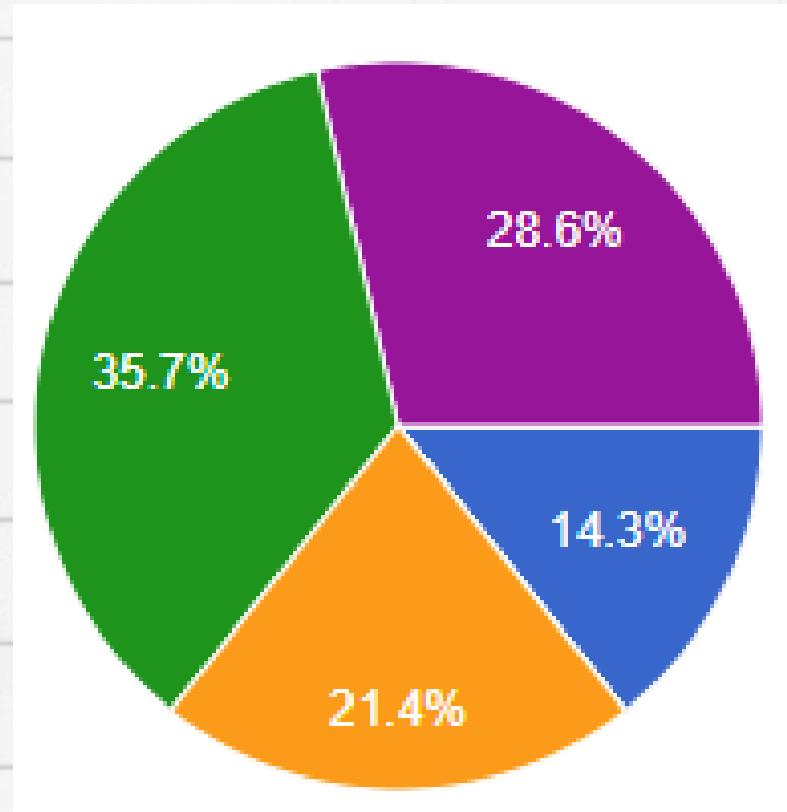
sondage réalisé sur un panel de 20 personnes

SONDAGE



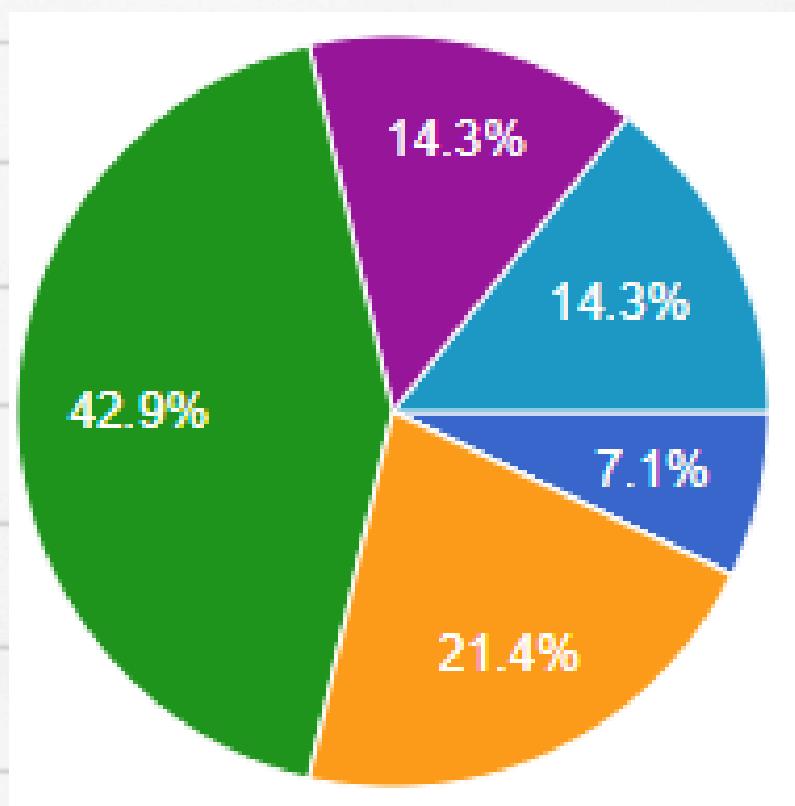
WATERSHED 1

SONDAGE



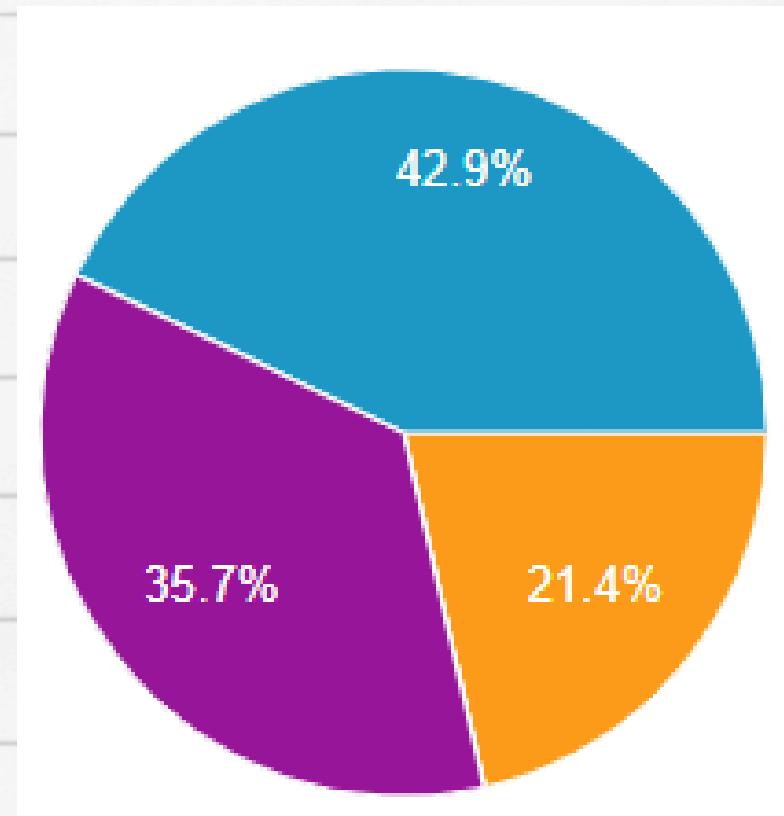
SLIC 1000 M=20

SONDAGE



SLIC 1000 M=20

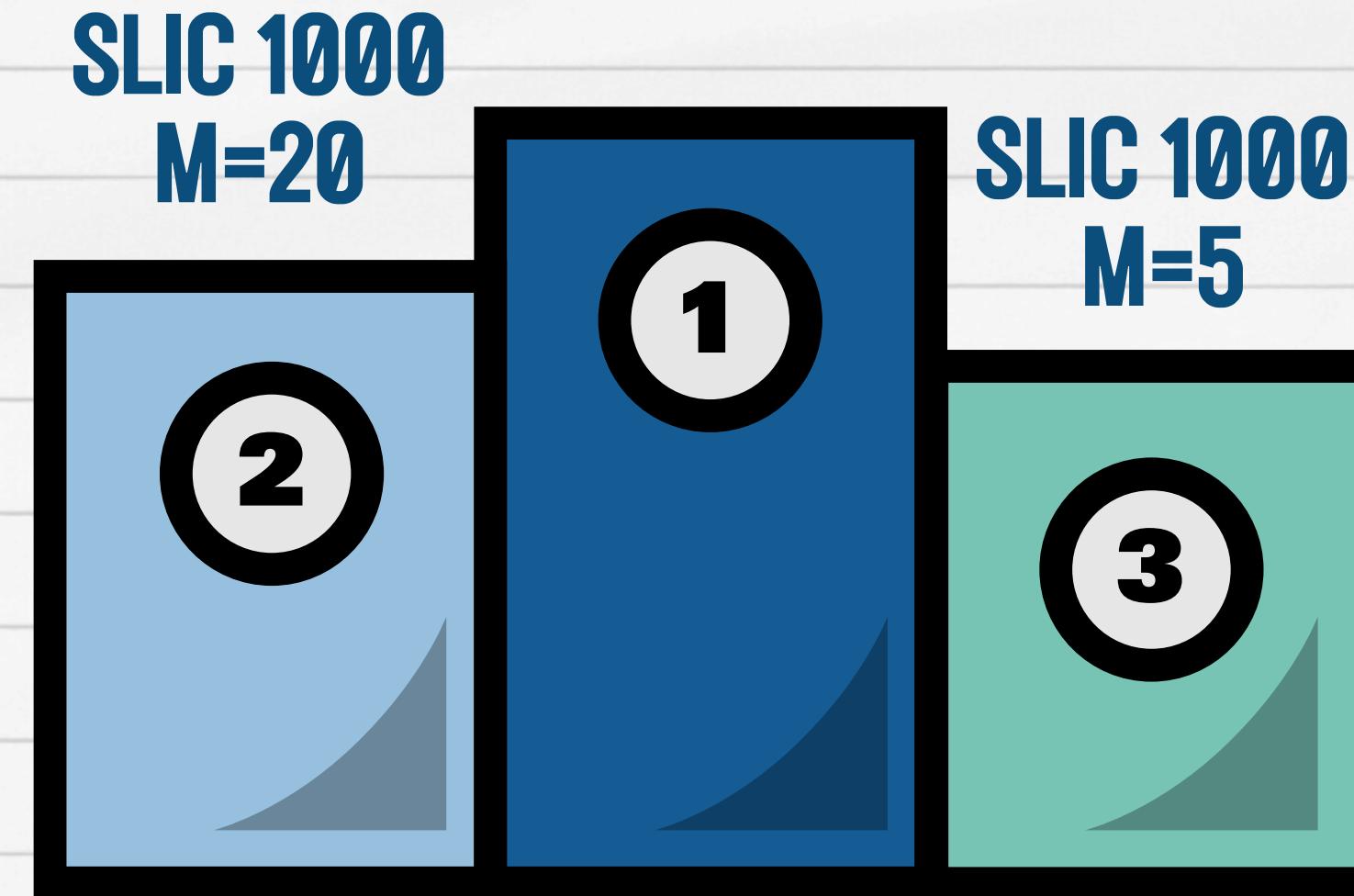
SONDAGE



WATERSHED 100

SONDAGE

WATERSHED 1



DÉMONSTRATION

FIN