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Avancement Simulateur IQ

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Binary Segmentation

10/01/2024

BT 100 InterMerger

MàJ du scaling

fs=4GSps
N_iq = 131072 * 128
NPERSEGS = [128, 256, 512, 1024, 2048, 8192, 32768, 131072]
Tous les spectrogrammes sans overlap et sans fenêtrage :

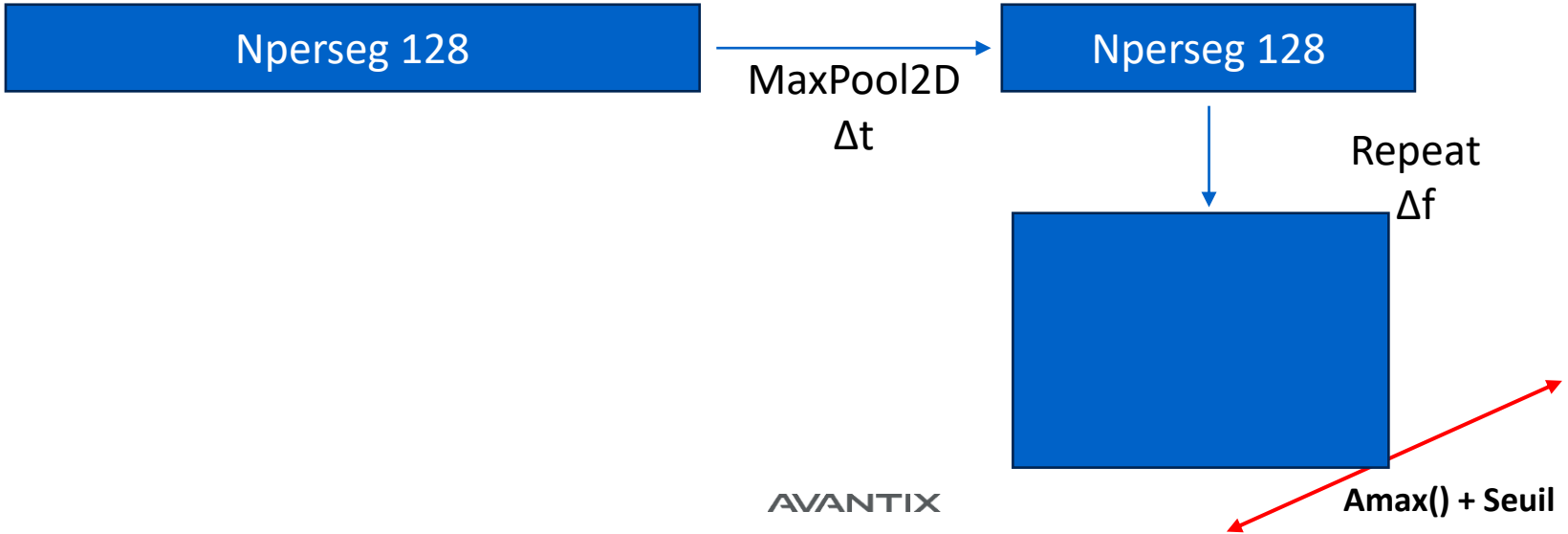
- $x = x.reshape(nperseg, -1)$
- $X = fft(x)$
- $\boldsymbol{sxx} = \frac{|\boldsymbol{X}|^{\boldsymbol{2}}}{\boldsymbol{nperseg} * \boldsymbol{\sigma_{noise}}^{2}}$

Seuil de binarisation « optimal » = 0 dB
Résolution du masque : ~1MHz en freq et ~1µs en temps
Définition du masque : 4096, 4096

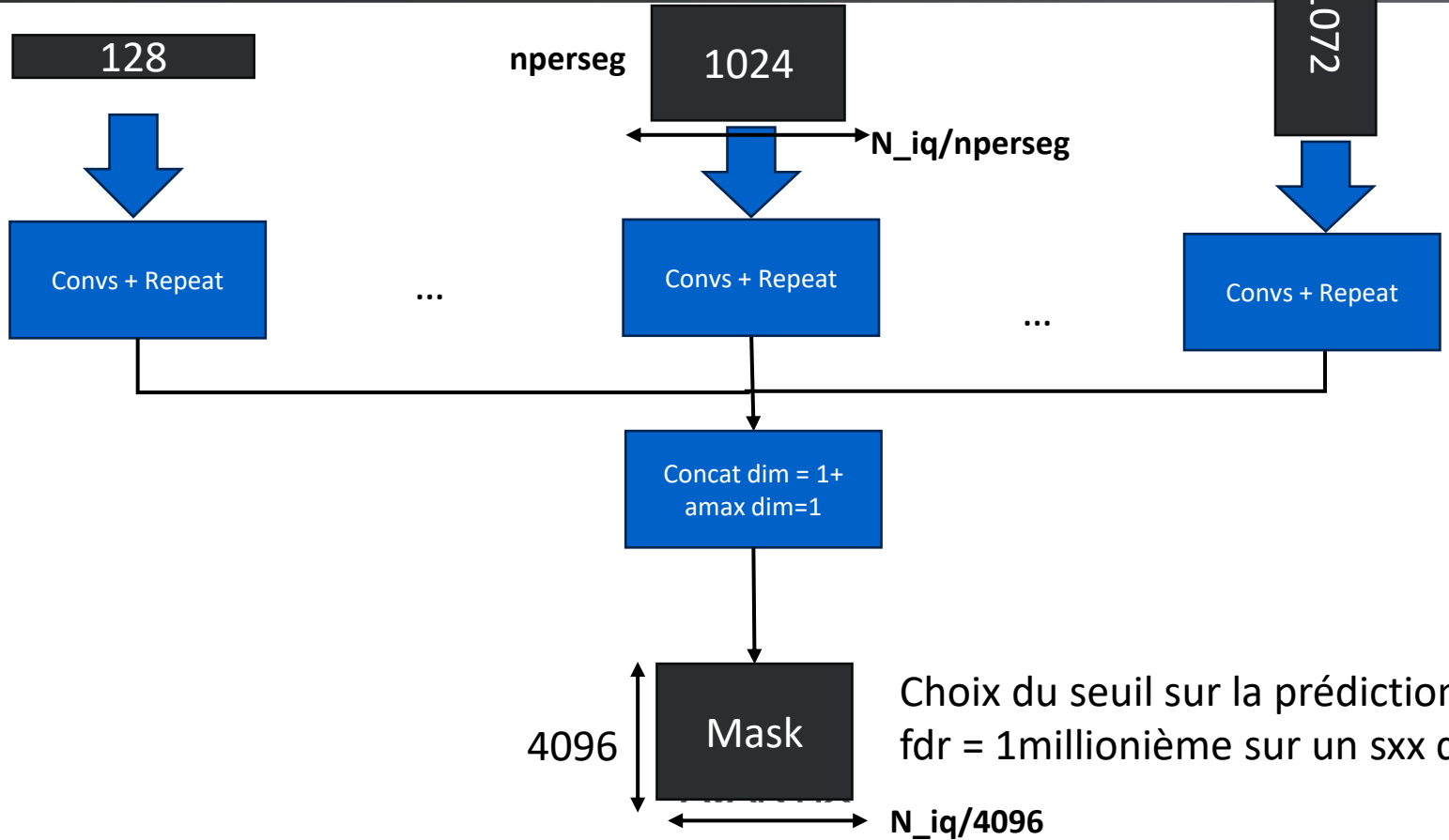
BT 100 InterMerger

Construction du masque :

1. Sur noiseless_sxx à tous les nperseg :
   - MaxPool sur la dimension la plus grande jusqu'à atteindre 4096
   - UpSampling en répétant sur l'autre dimension jusqu'à atteindre 4096
2. AMAX(noiseless_sxx_resized) > -3 dB



Architecture



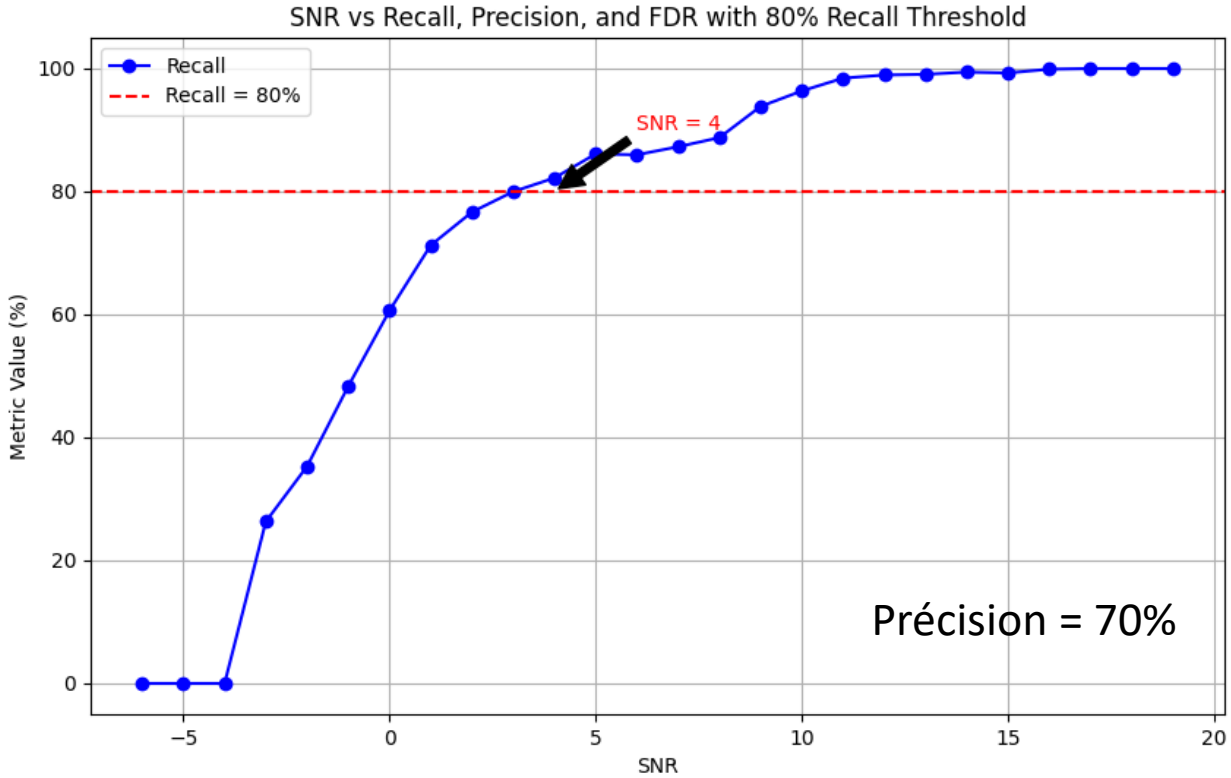
Choix du seuil sur la prédiction :
fdr = 1millionième sur un sxx de bruit

Torch vs TensorRT

Torch (nn Module) : 3,9
Avec TensorRT : 4,5

Hypothèse : TensorRT a du mal à optimiser les mpodèles à plusieurs entrées et/ou ayant des couches de repeat

Num_kernels = 1 Résultats inférence



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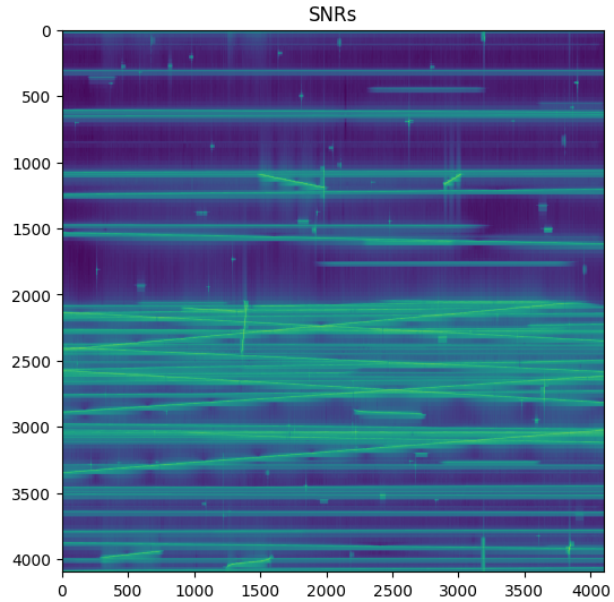

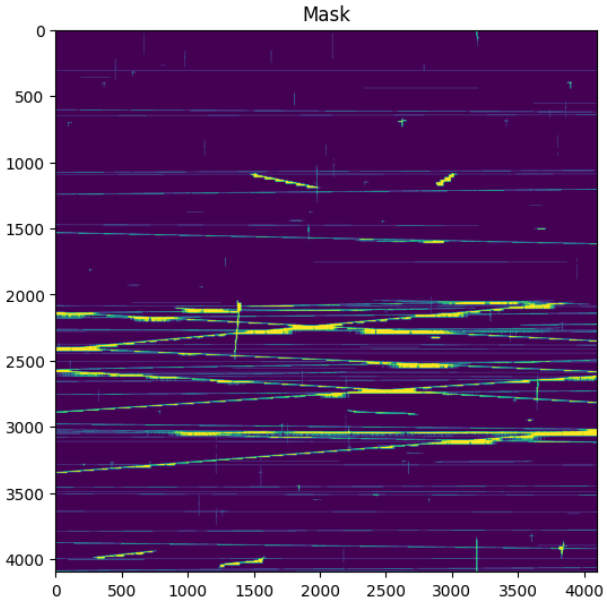

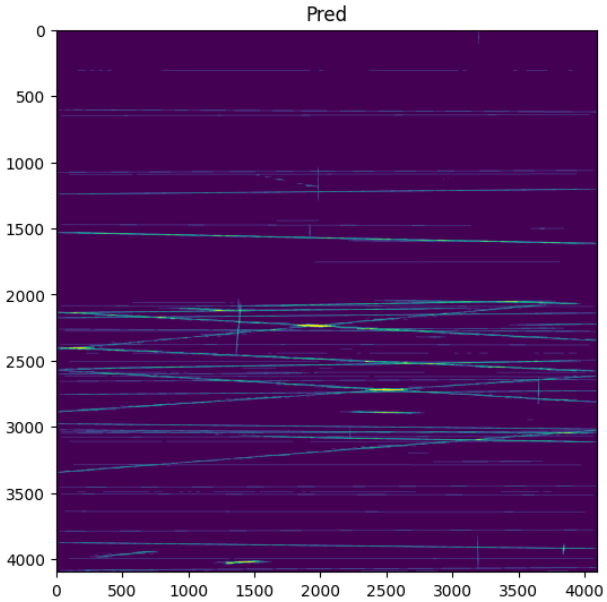

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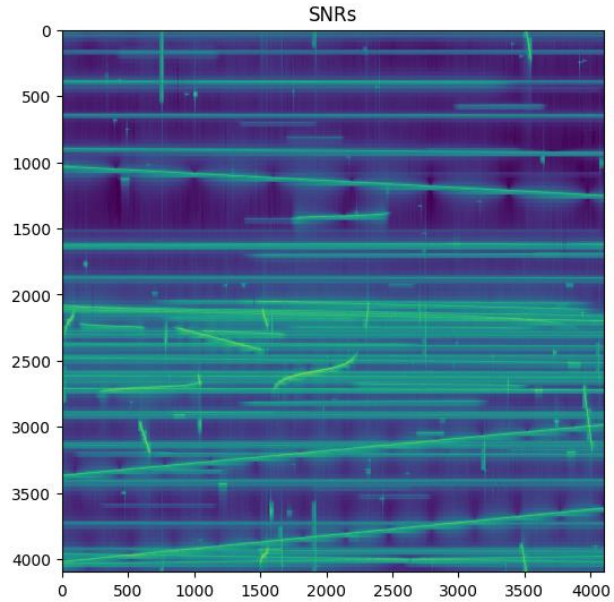

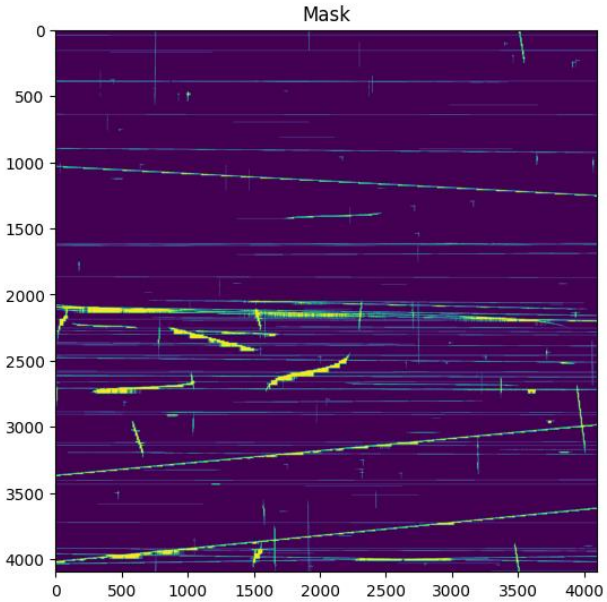

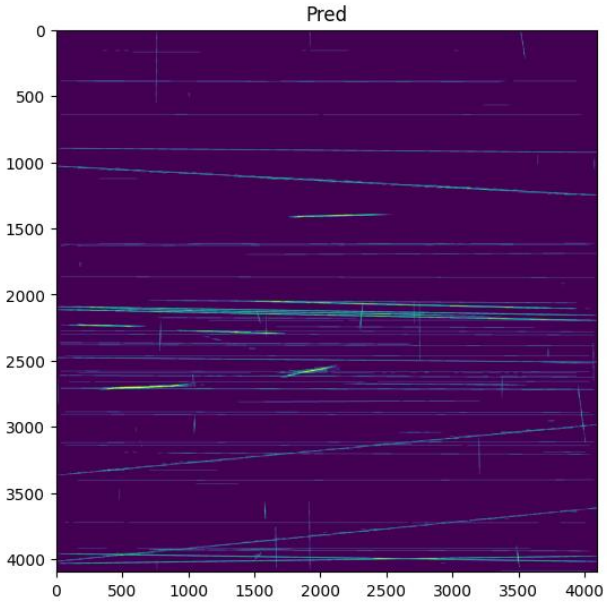

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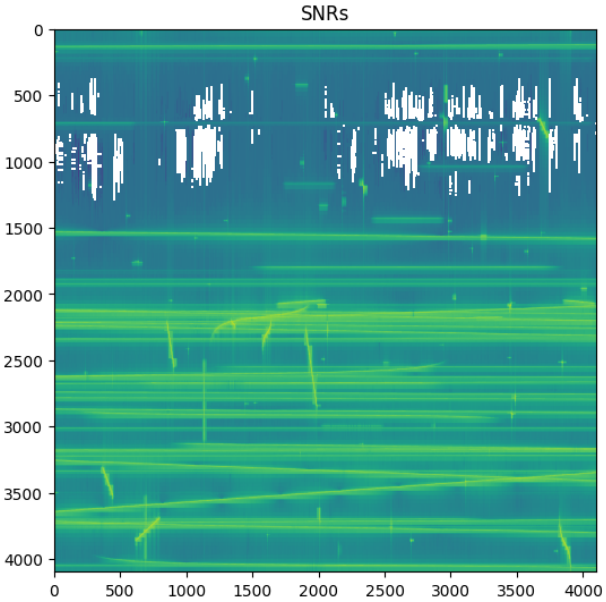

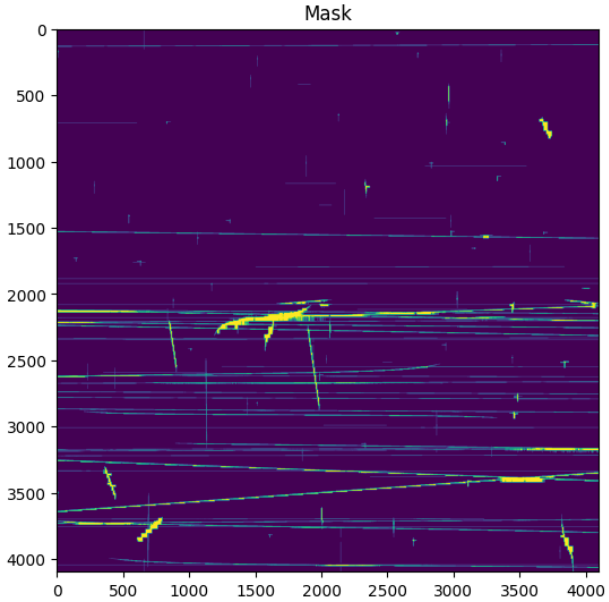

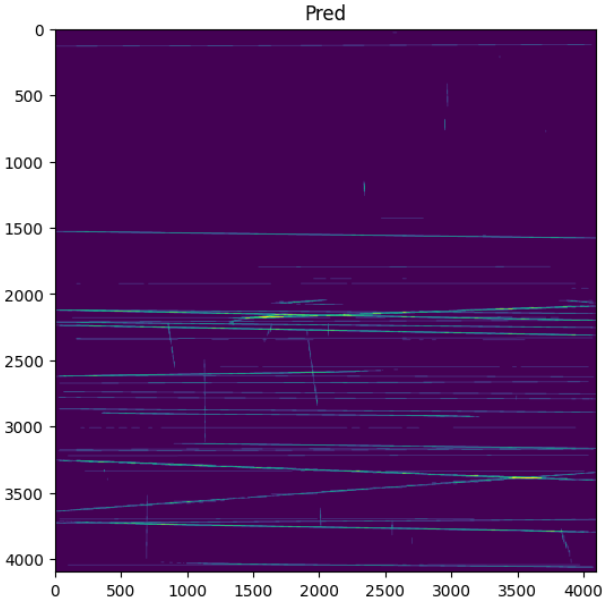

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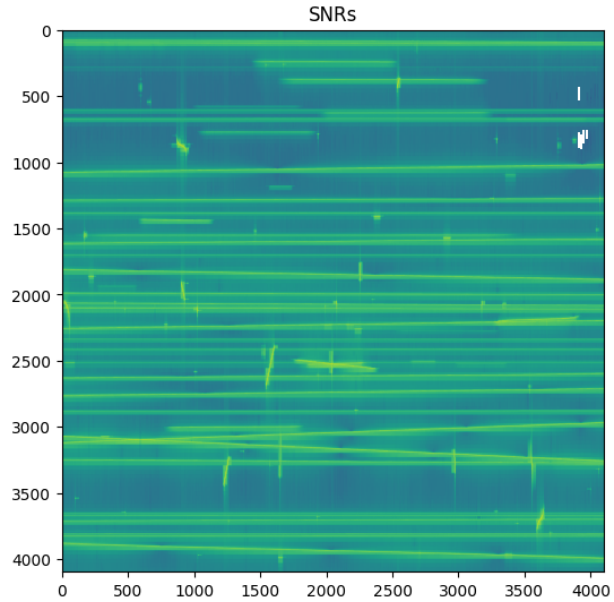

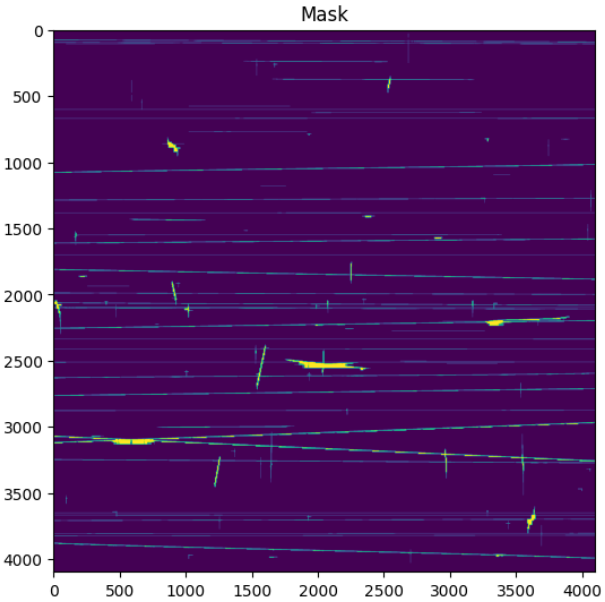

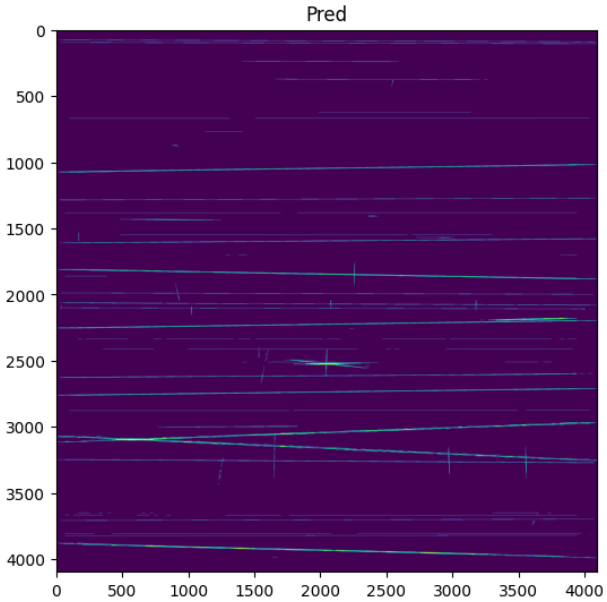

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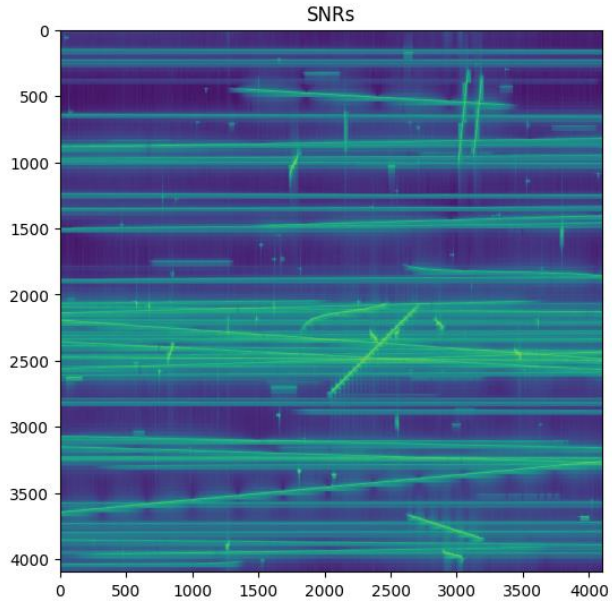

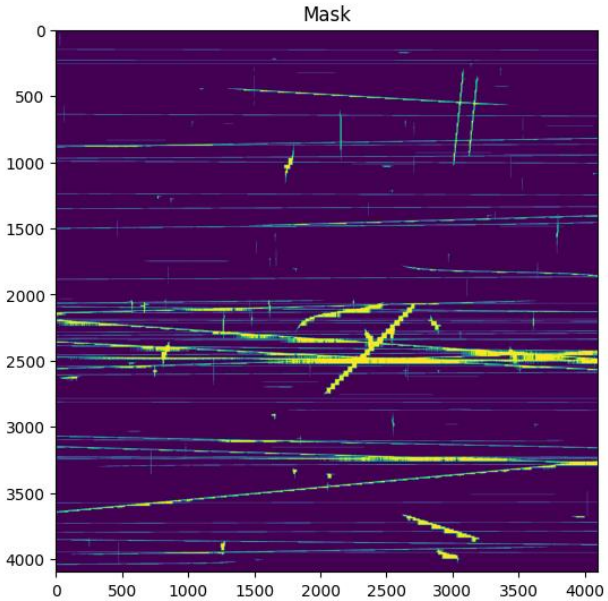

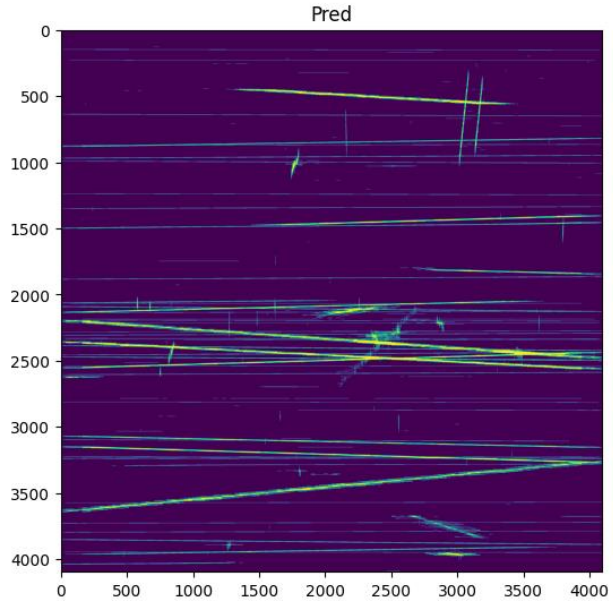

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Experimentation input_shape

10/01/2024

Ratio temps réel modèle InterMerger

L'objectif était de savoir si le RTR dépend du type de formatage : concaténation sur batch vs temporelle

Résultat : aucune différence

Input shape avec num_kernels = 8	RTR
(16, 1, 128, 131072) Concaténation batch	1,5
(1, 1, 128, 16*131072) Concaténation tempo	1,5

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