

UNSUPERVISED ALGORITHM

SEISMIC SECTION

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graph TD; A[SEISMIC SECTION] --> B[SEMBLANC]; A --> C[CHAOS]; A --> D[CURVATURE]; A --> E[SEMBLANC]; B --> F[FEATURES]; C --> F; D --> F; E --> F; F --> G[K MEANS K=2]; G --> H[FAULT ZONES]; G --> I[NON-FAULT ZONES]; H --> J[SEGMENTED FAULTS];
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The diagram illustrates an unsupervised algorithm for fault zone segmentation. It begins with a 'SEISMIC SECTION' box at the top. Four red arrows point from this box to four separate boxes below it: 'SEMBLANC', 'CHAOS', 'CURVATURE', and 'SEMBLANC'. From each of these four boxes, a red arrow points to a central 'FEATURES' box. A single red arrow then points from 'FEATURES' to a box labeled 'K MEANS (K=2)'. From this box, two red arrows point to 'FAULT ZONES' and 'NON-FAULT ZONES'. Finally, a red arrow points from 'FAULT ZONES' to a box labeled 'SEGMENTED FAULTS'.

SEMBLANC

CHAOS

CURVATURE

SEMBLANC

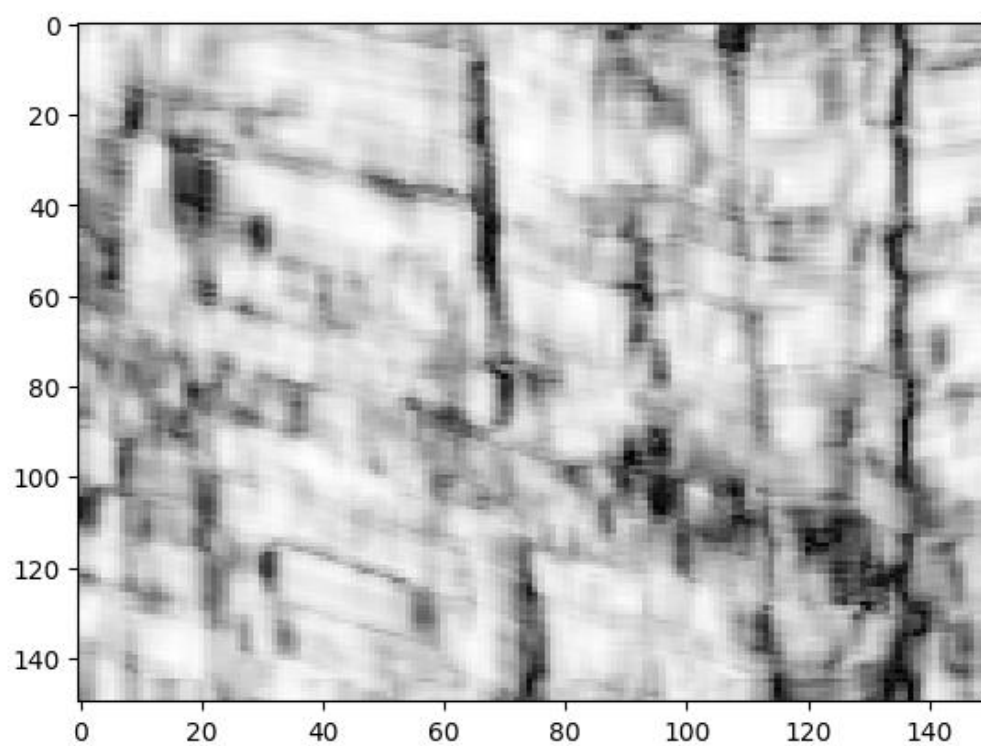
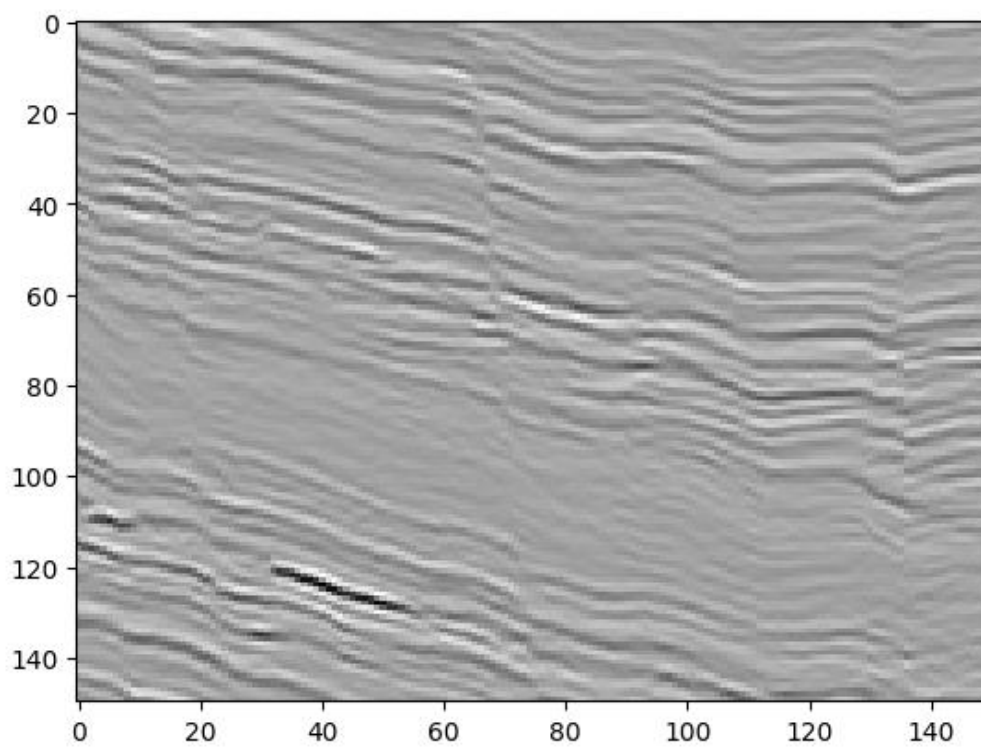
FEATURES

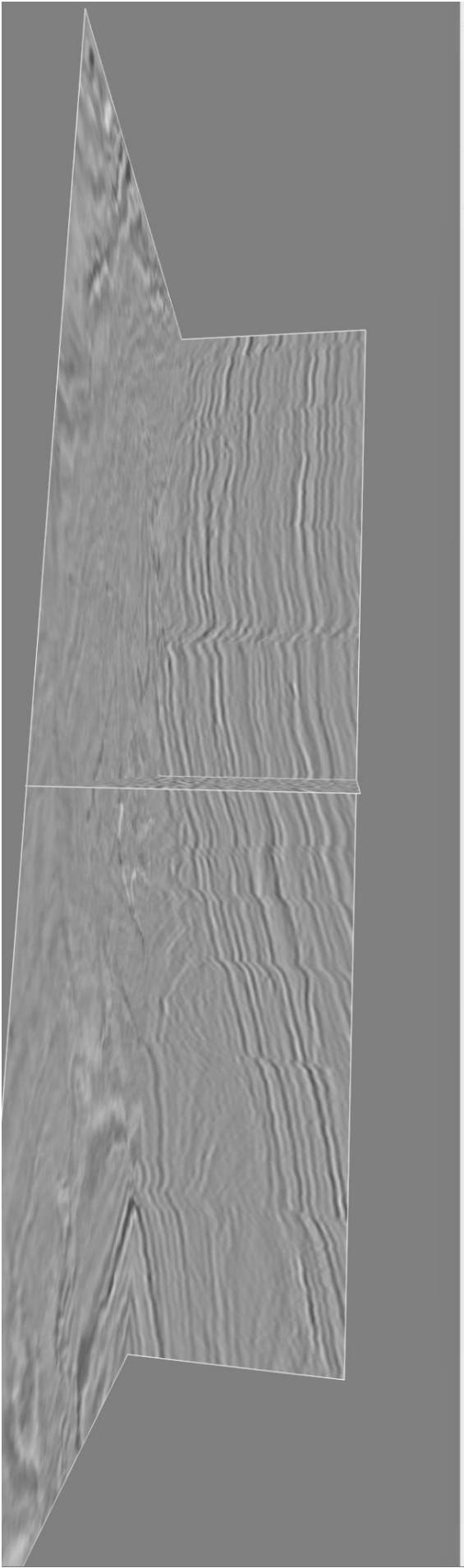
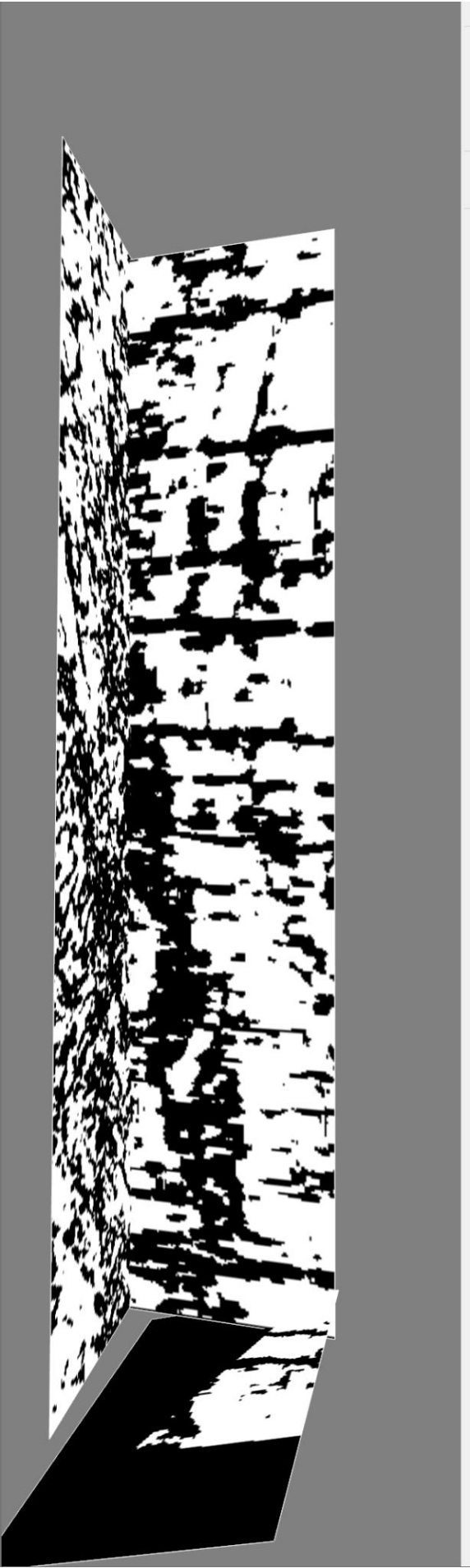
K MEANS (K=2)

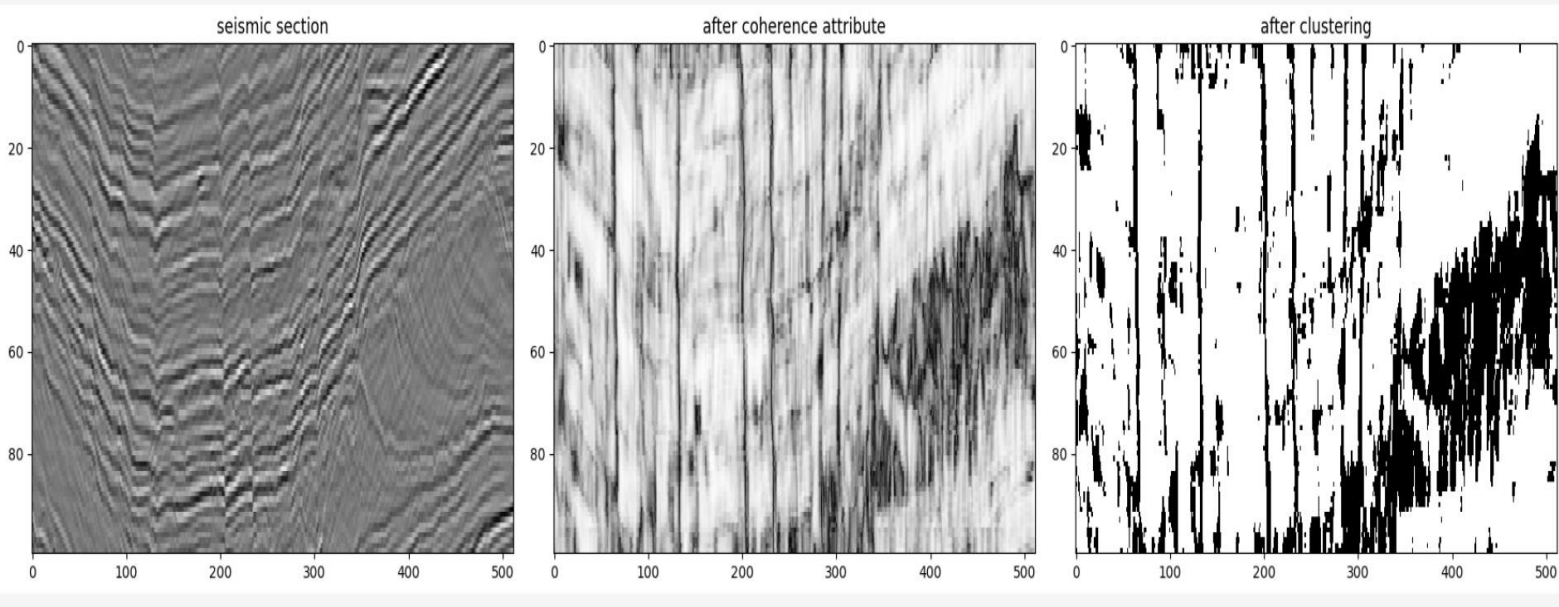
FAULT ZONES

NON-FAULT ZONES

SEGMENTED
FAULTS



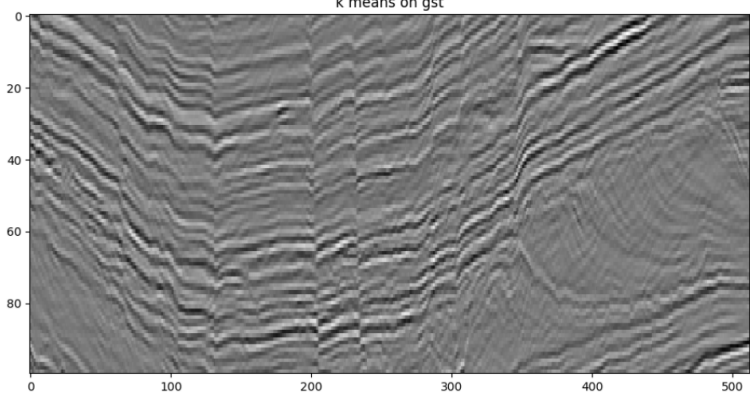




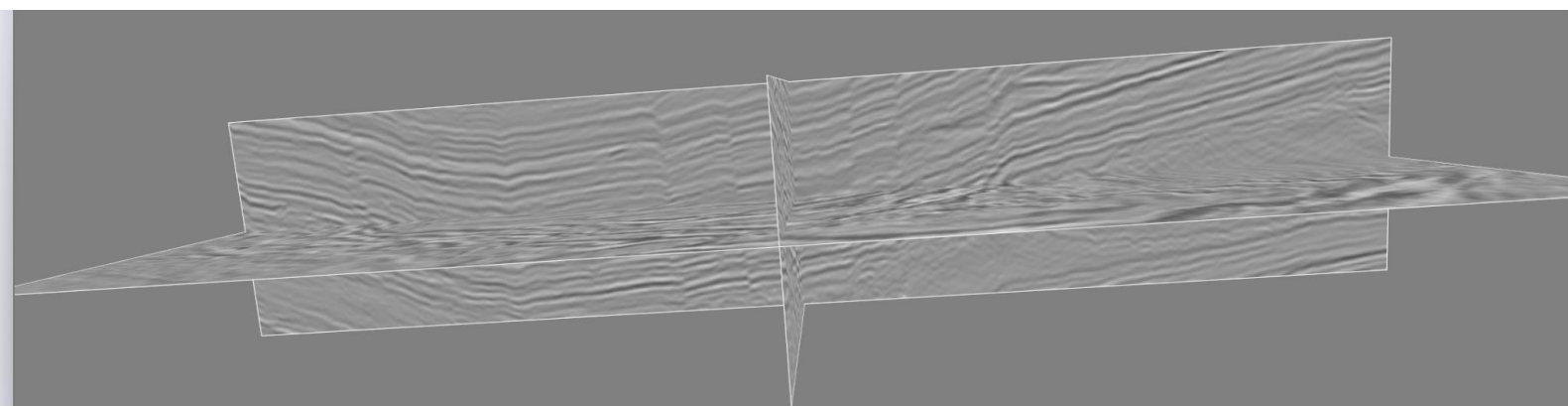
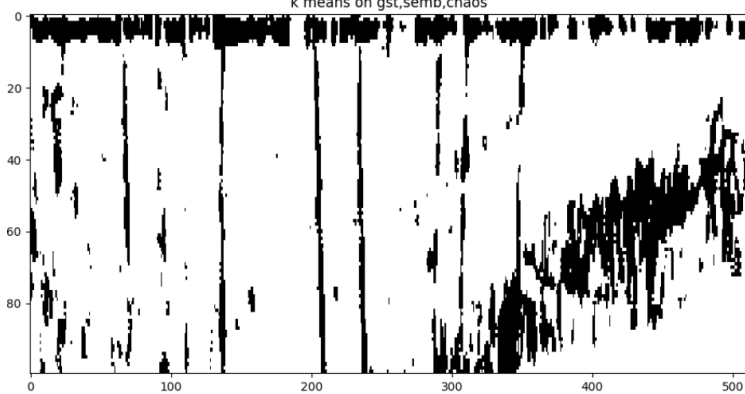
- Tested many attributes to choose best attributes to use as features
- Chose coherence, semblance, chaos attribute to use as feature
- Calculated these attributes of the whole 3D volume
- Applied K - means clustering using each voxel as a sample having 3 features
- Divided all voxels into two classes (fault and non-fault)

inline 43

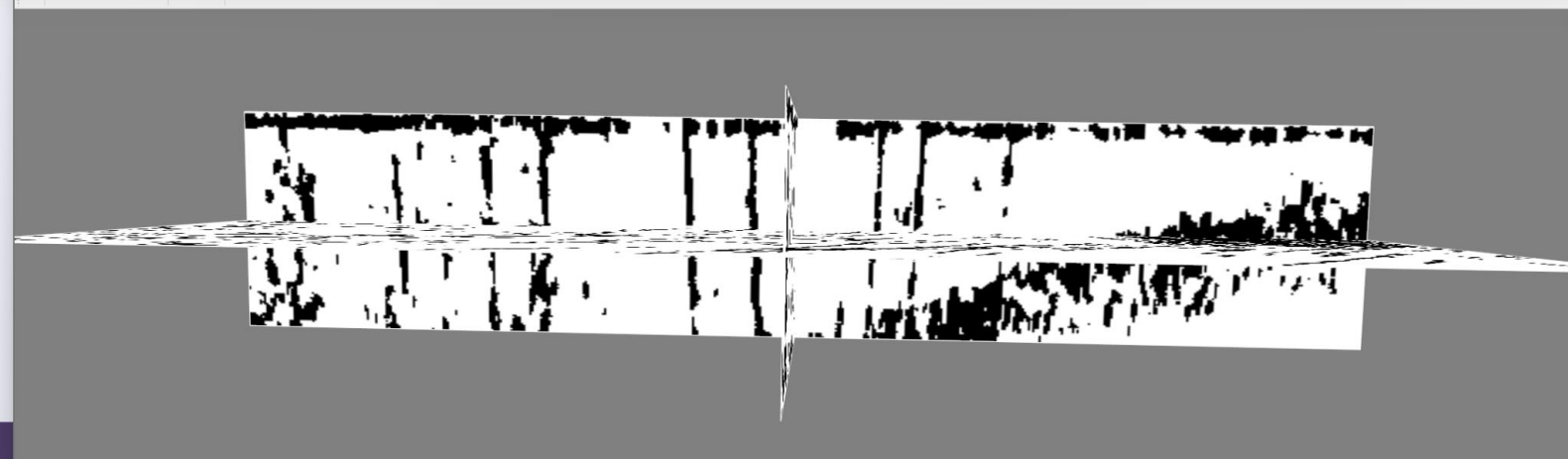
k means on gst



k means on gst,semb,chaos

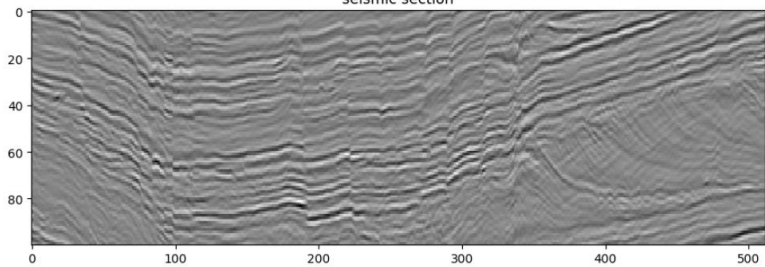


fault cube

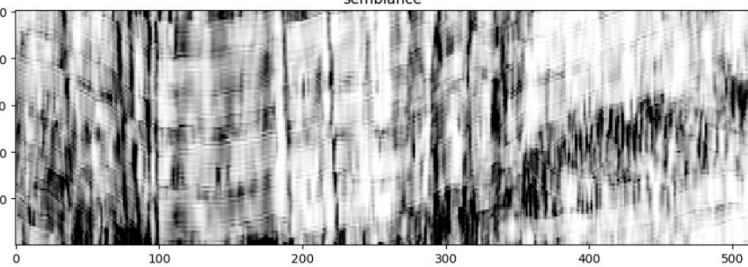


inline  41

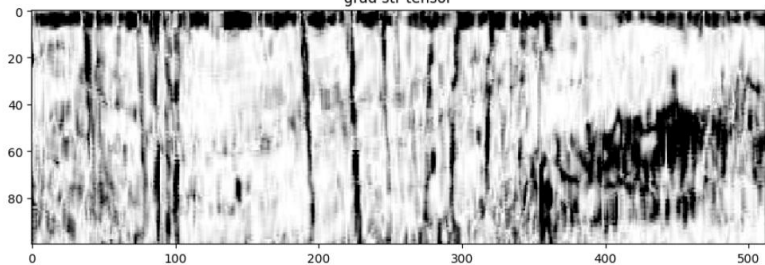
seismic section



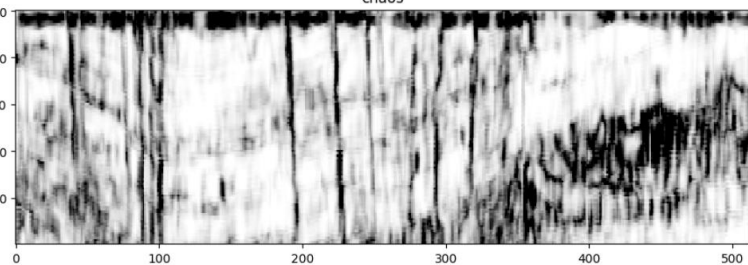
semblance



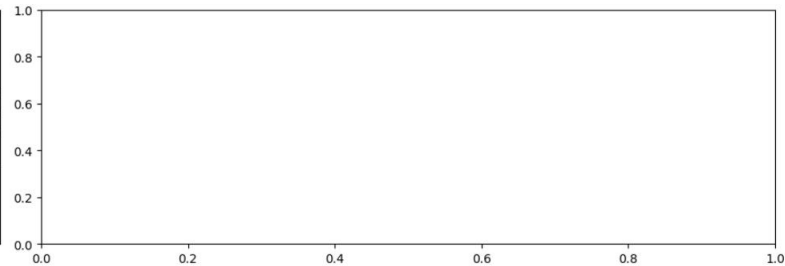
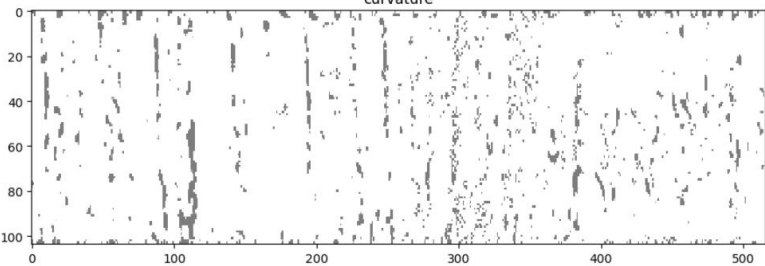
grad str tensor



chaos

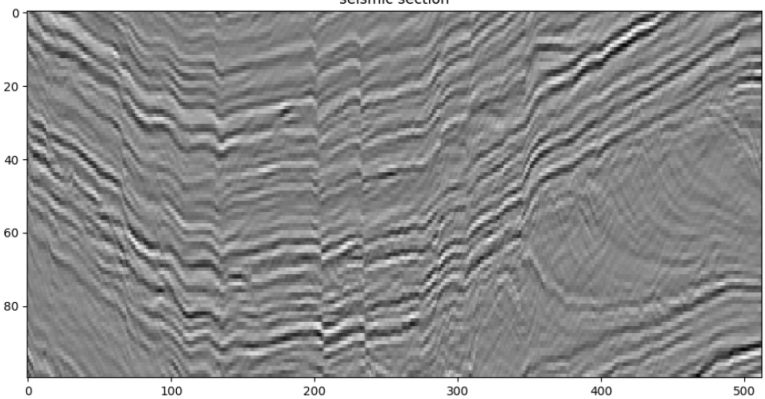


curvature



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seismic section



faults

