

REPORT DOCUMENTATION PAGE

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Algorithms and Software for Improved CT Imaging

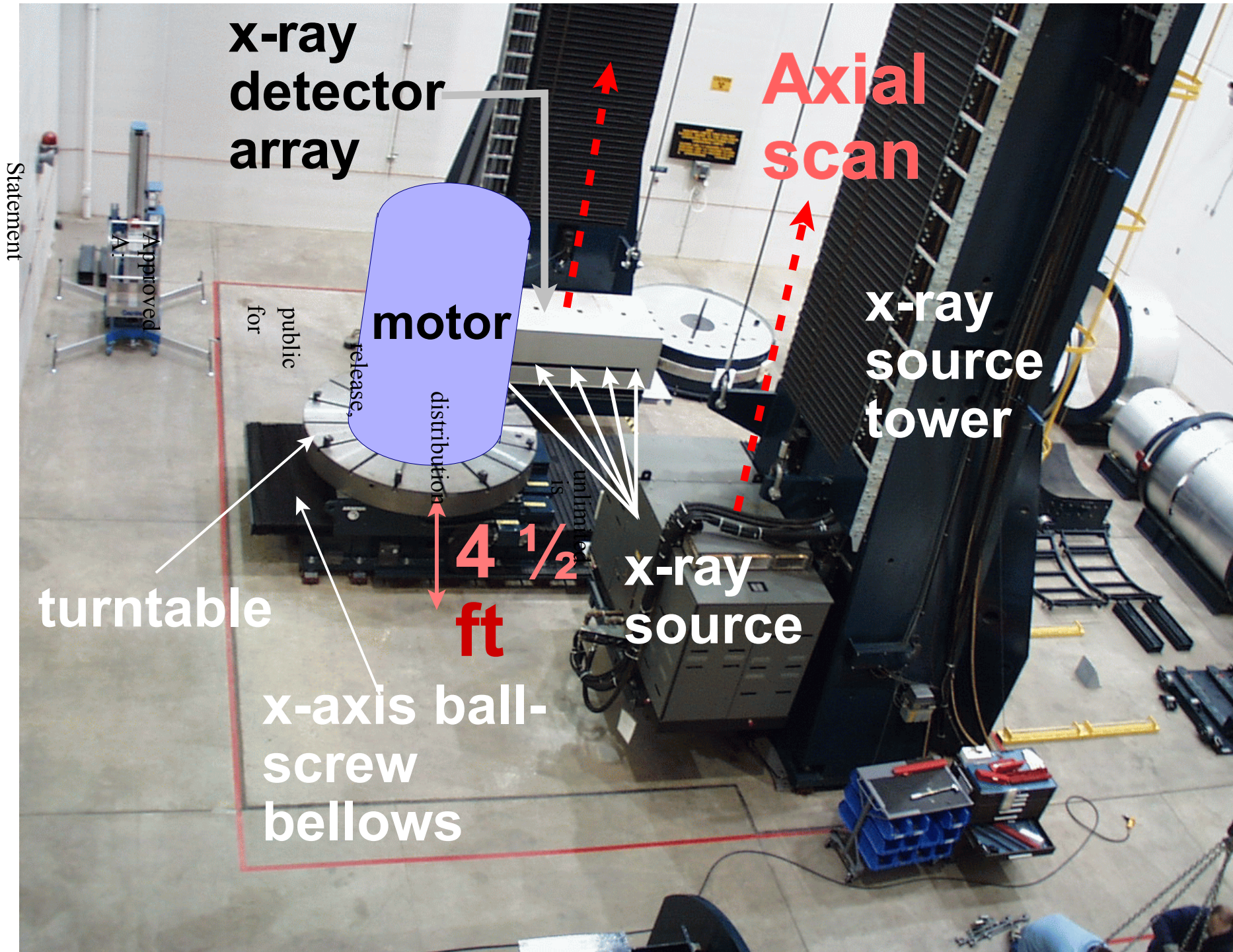
Promotional slides for Industrial Clients

Tim Holmes, D.Sc.
CEO
Lickenbrock Technologies

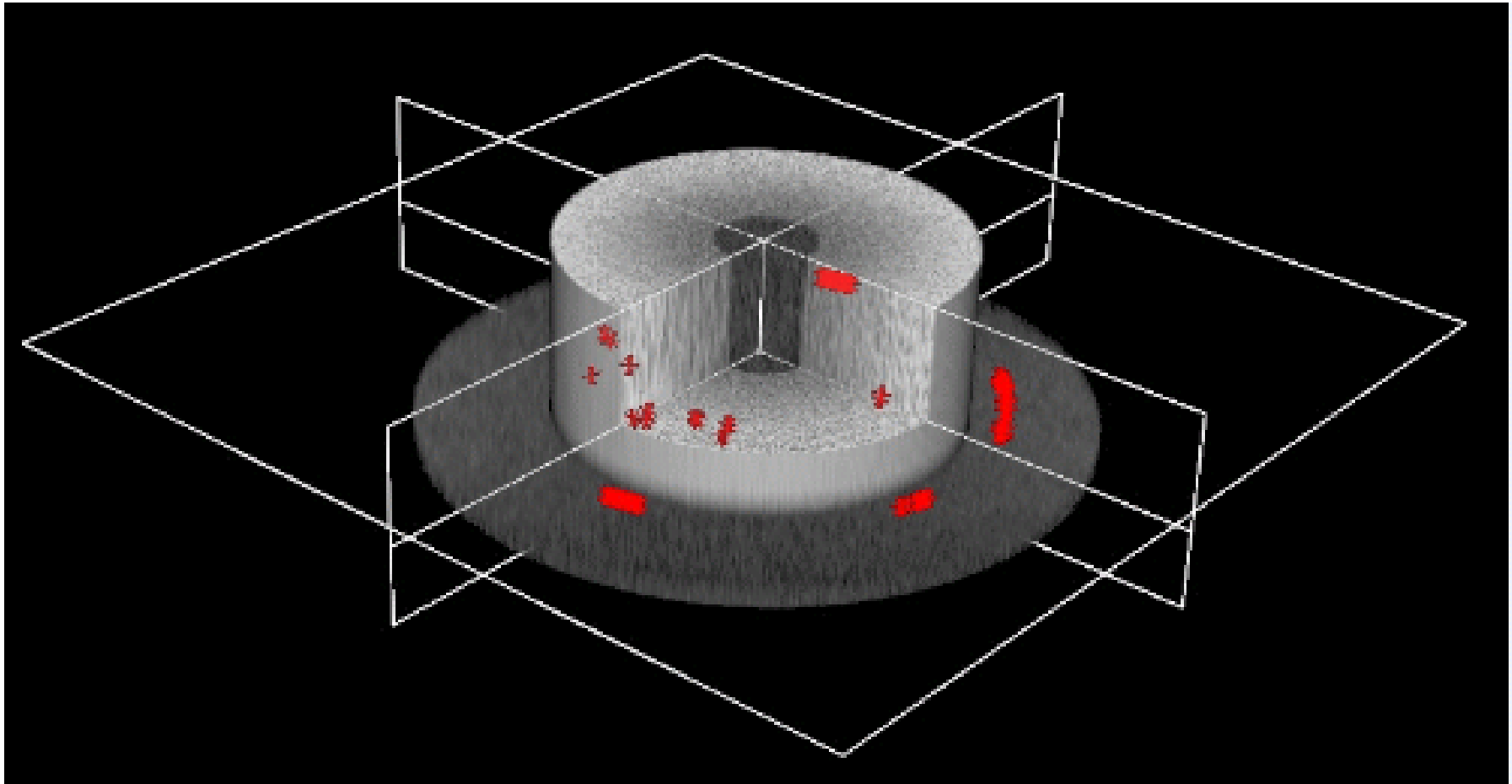


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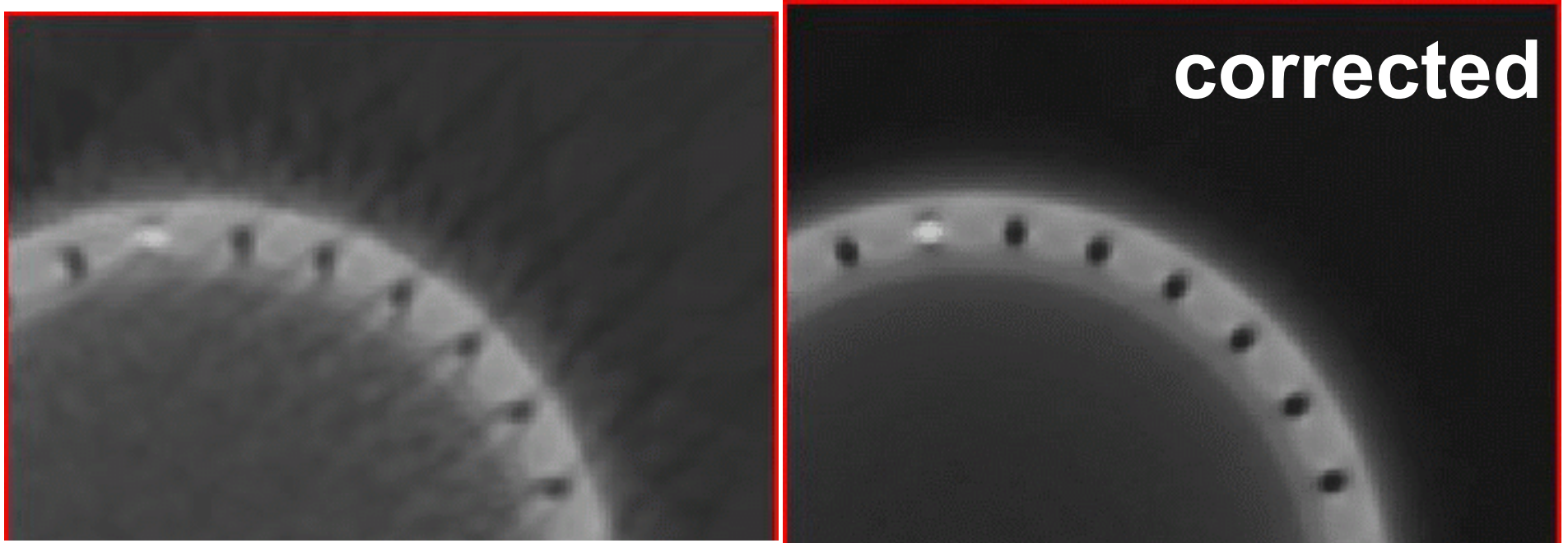


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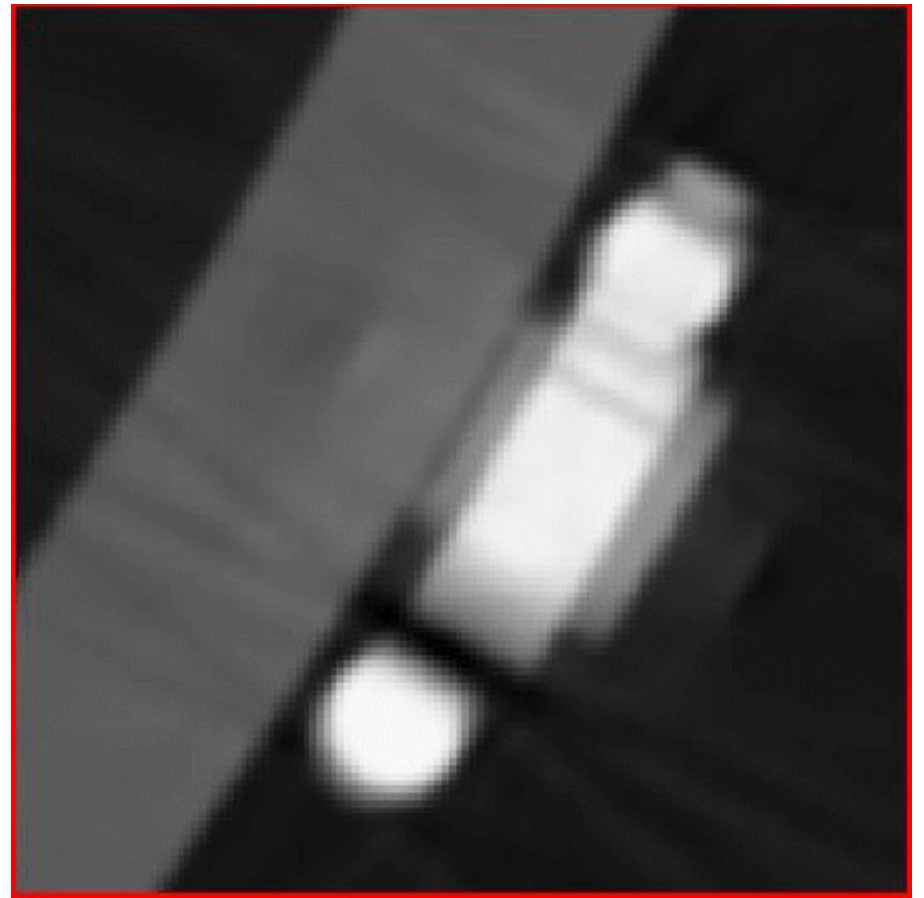
3D ANDES Viewer, showing a 3D phantom, which simulates an aerospace component, overlain with graphics that indicate locations of potential defects. The 3D viewer, with other analysis tools enable the capability to evaluate true positive detections from false positive detections.

Traverse mismatch correction



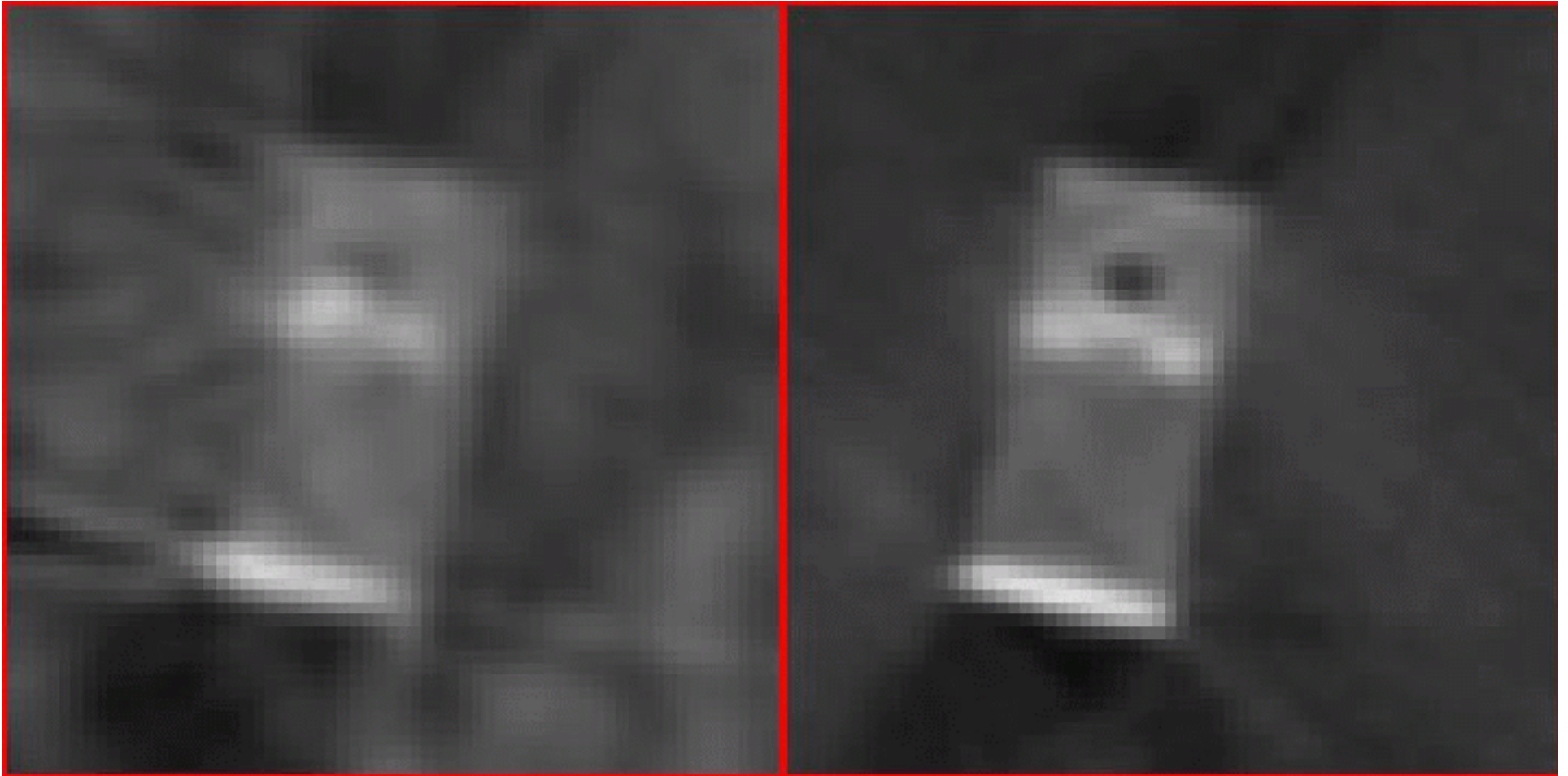
Example of the data corrections using an aerospace component . (a) The artifactual streaks are due to unavoidable geometric misalignments, called traverse mismatch. (b) Image resulting from the automatic detection and correction of the data for these misalignments.

Traverse mismatch correction



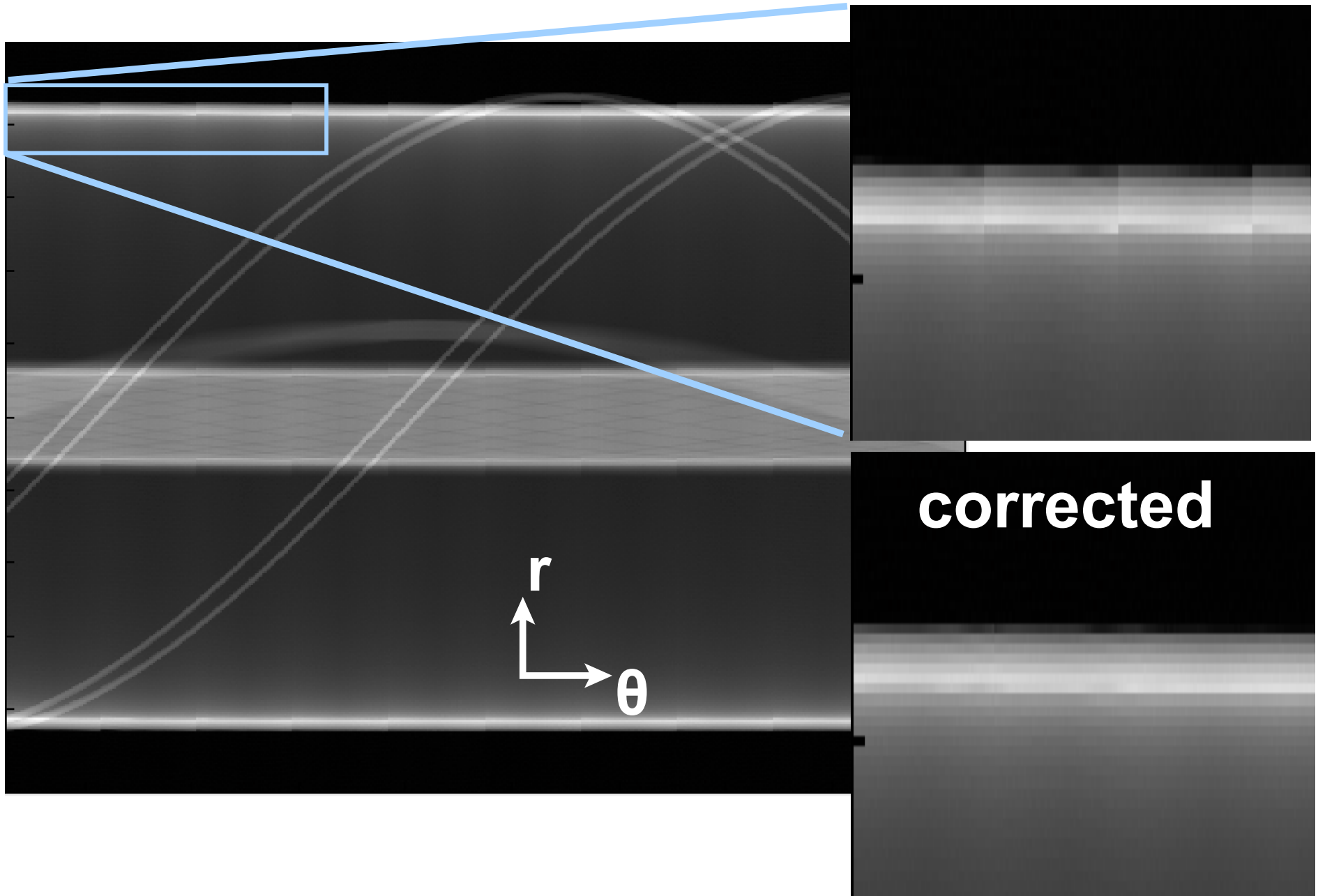
corrected

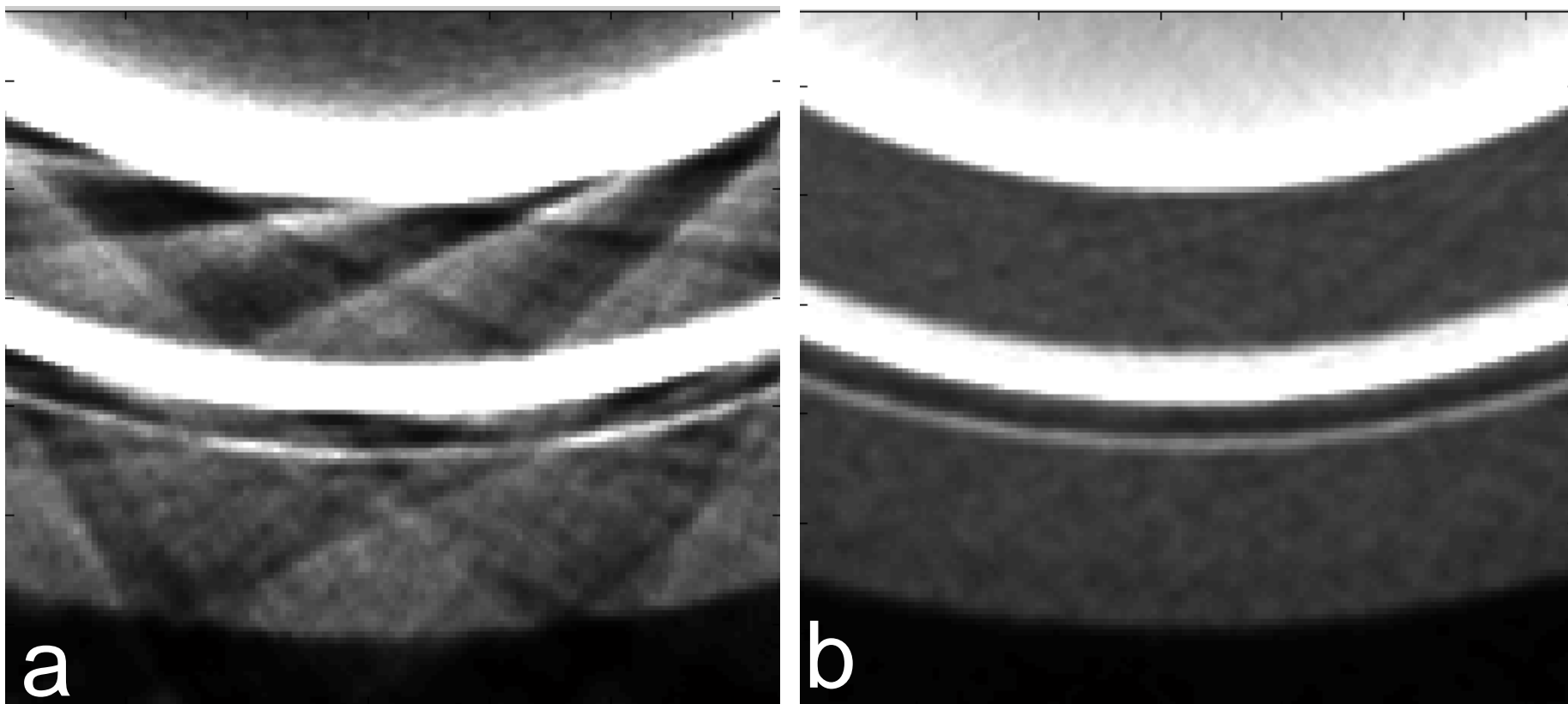
Traverse mismatch correction



corrected

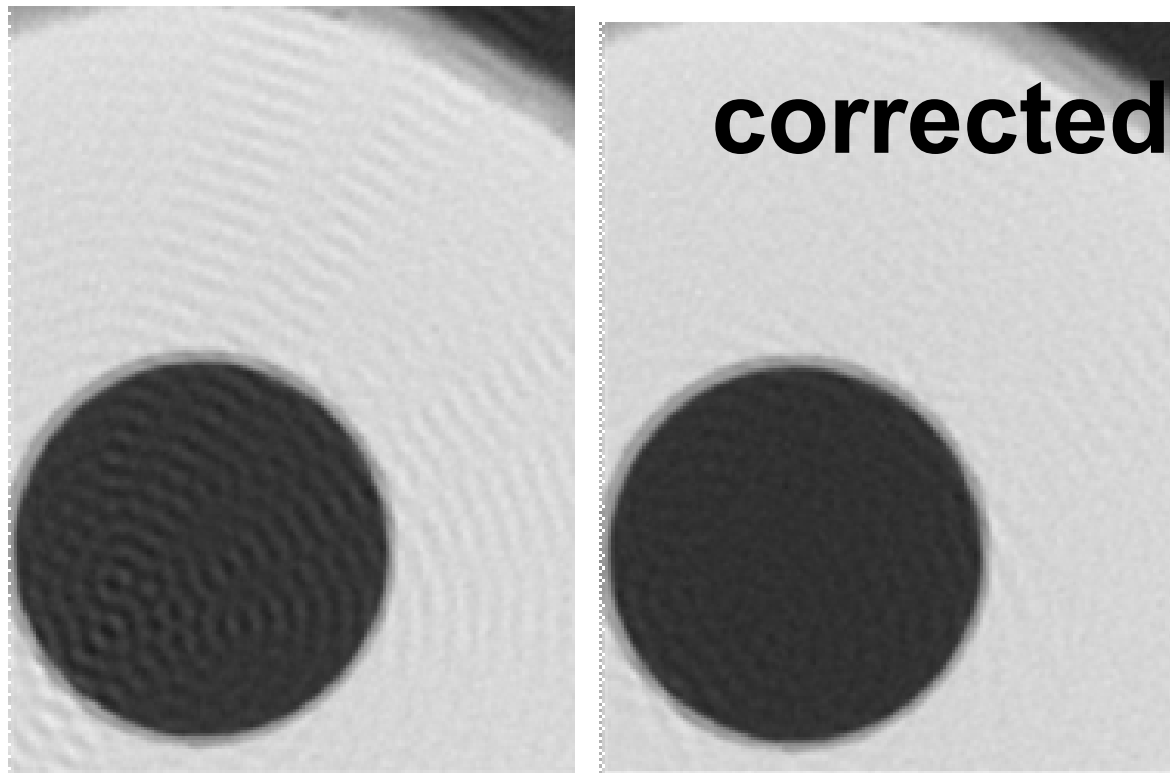
Traverse mismatch in the sinogram

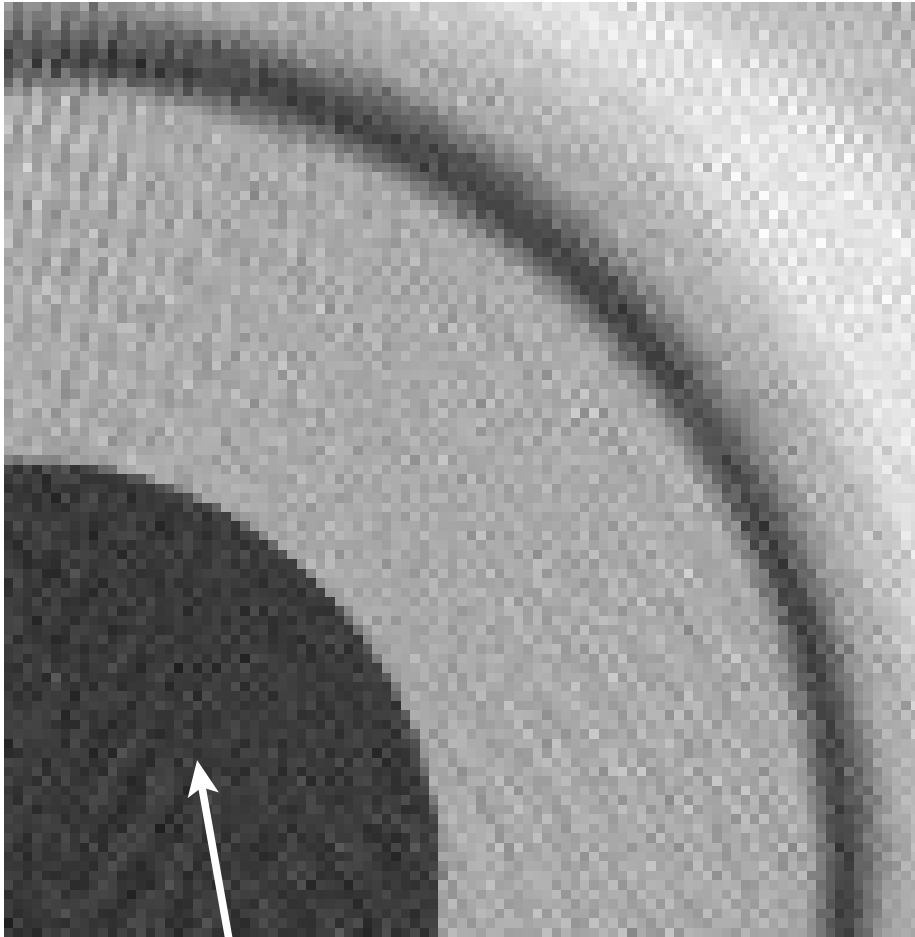




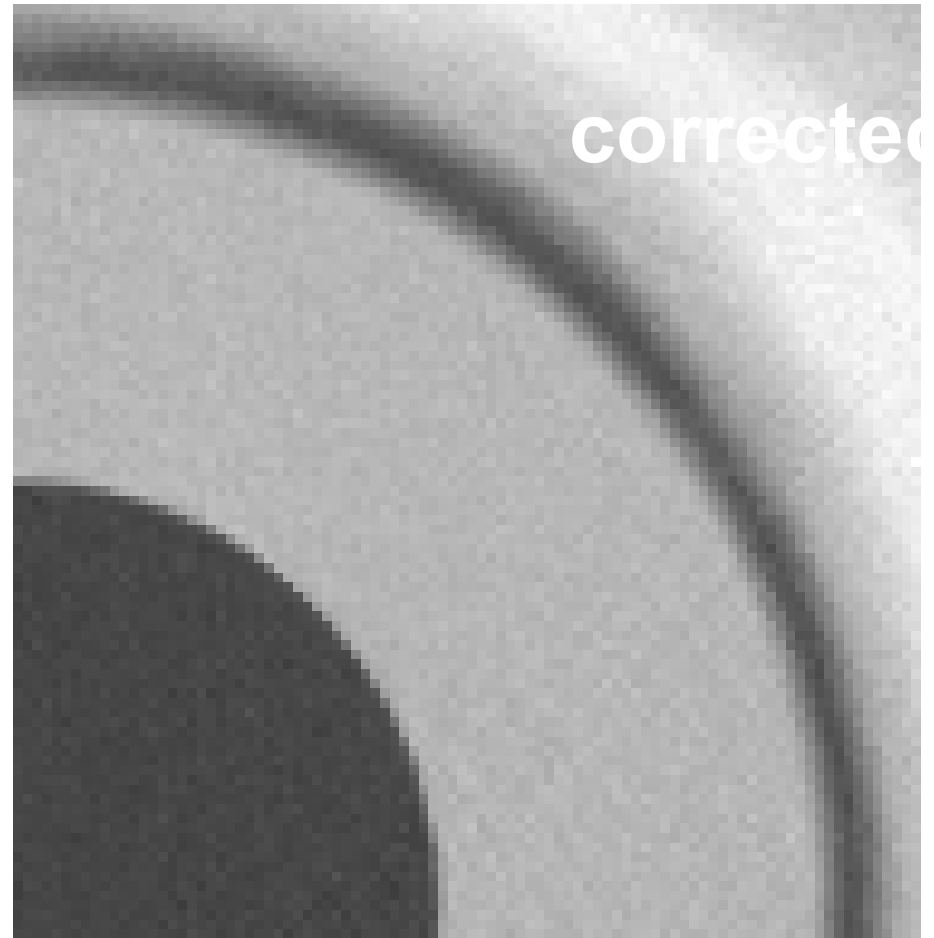
Example of the data corrections, using a small ROI of an aerospace component. (a) The artifactual streaks are due to high-Z and beam hardening. (b) Image resulting from the corrections. Other data corrections have similar remarkable impact on image fidelity.

Railroad track correction





railroad track



corrected

Frequency spectrum of the columns of the sinogram



Contrast

10840.0

3118.0

Reset Max:

Left Right

Adjust

Min Max

Apply to:

Left Right

-48.0

-184.0

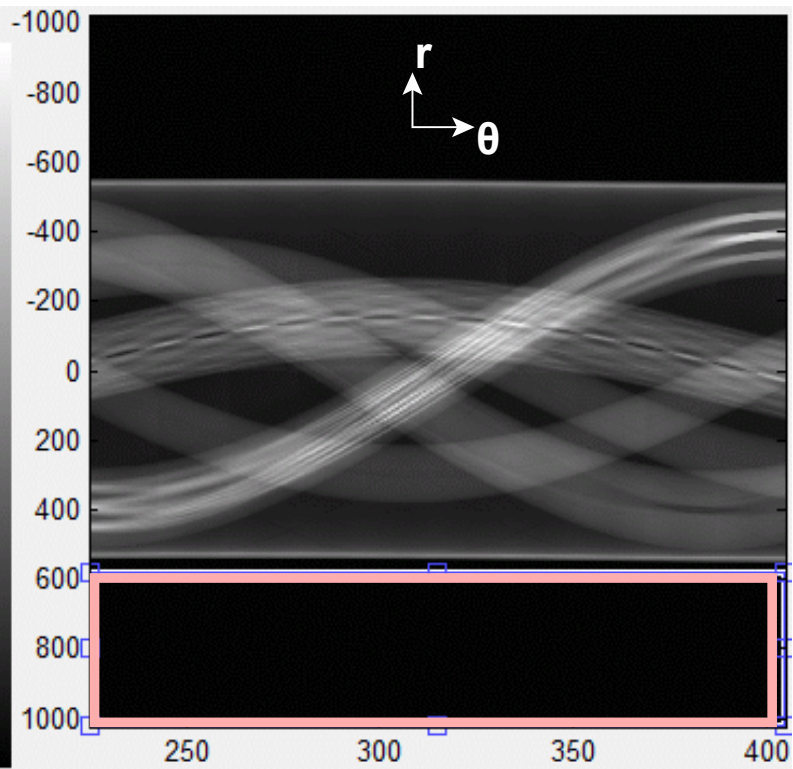
Reset Min:

Left Right

x-axis units

cycles/sec

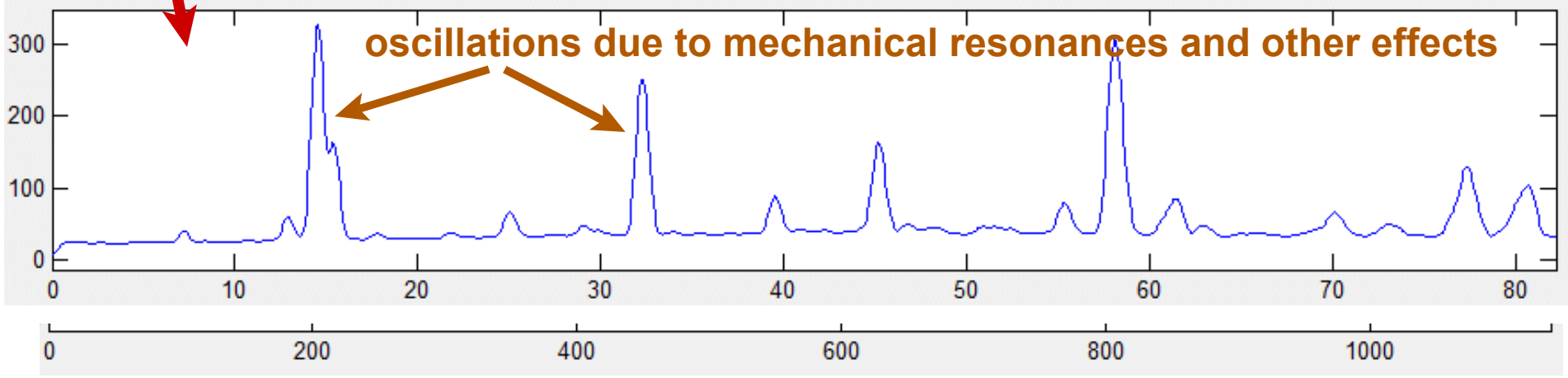
cycles/meter



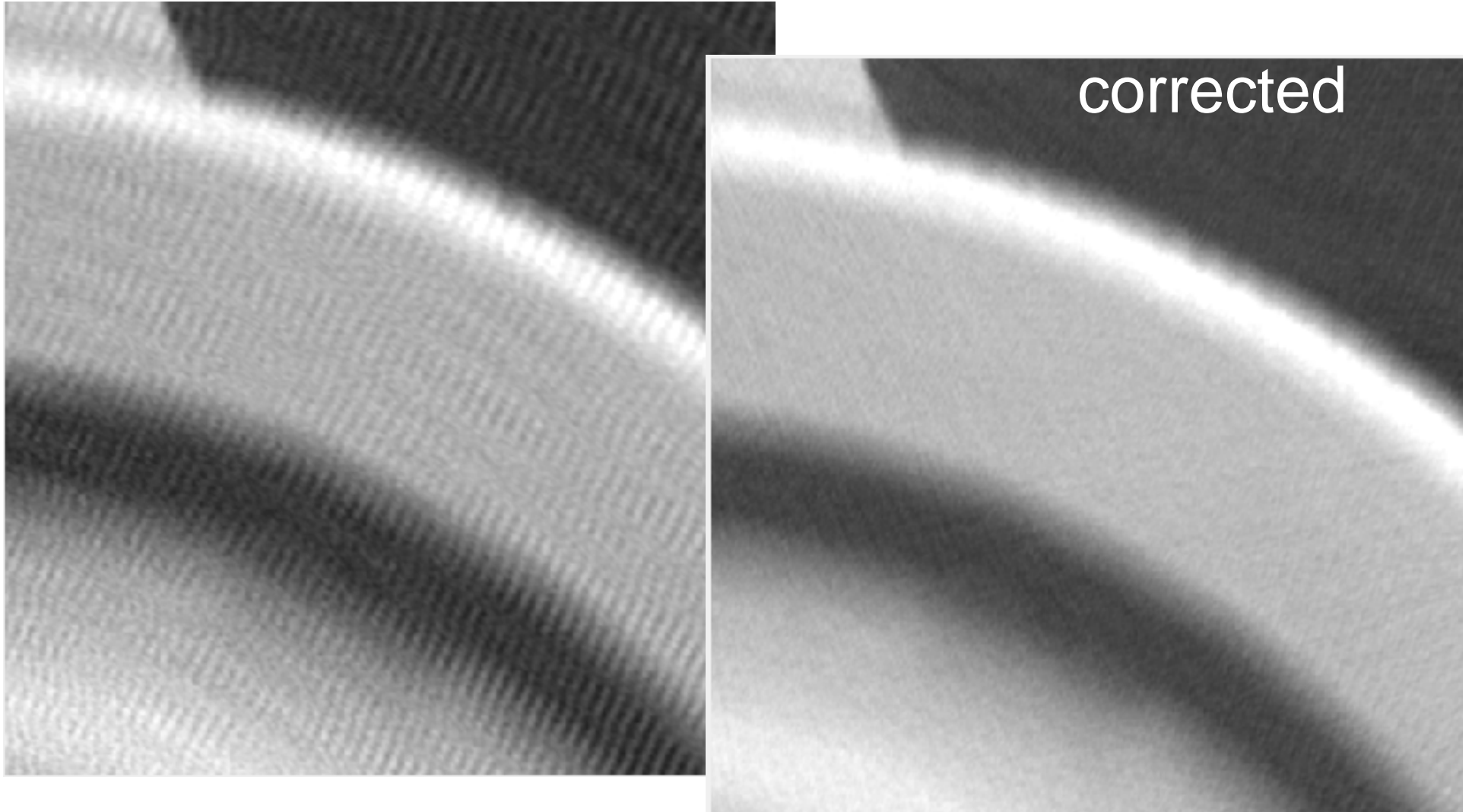
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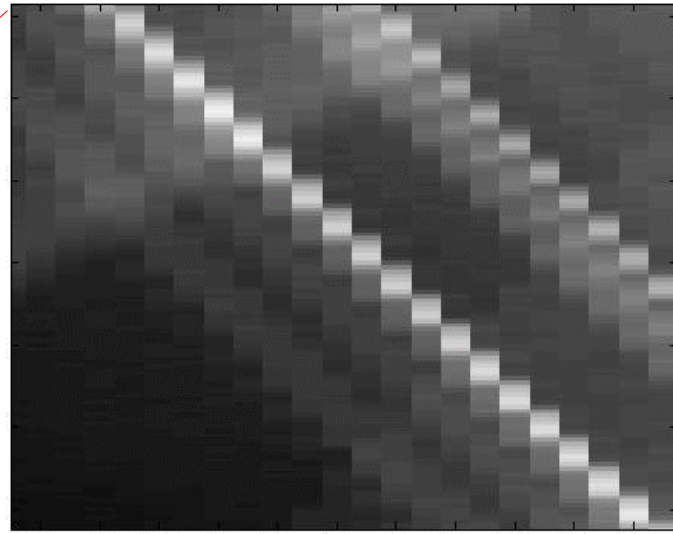
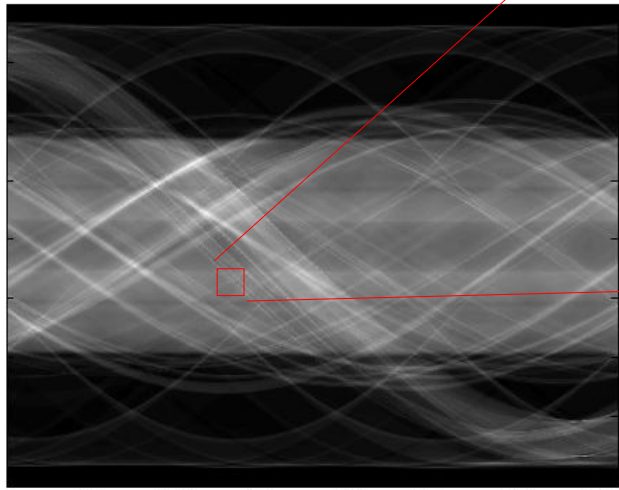
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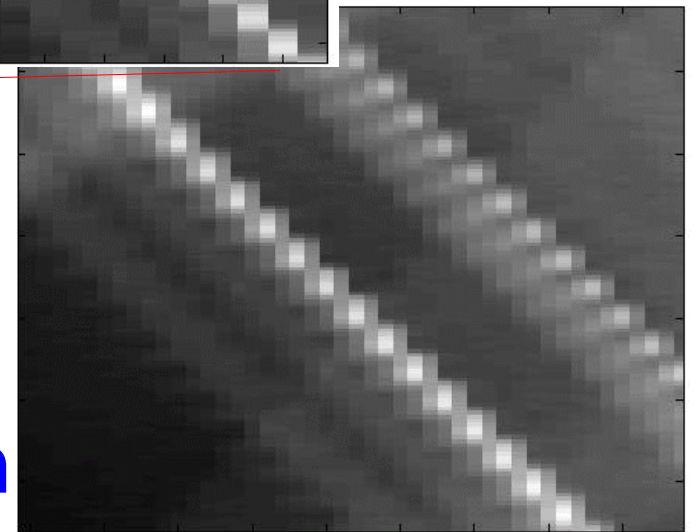
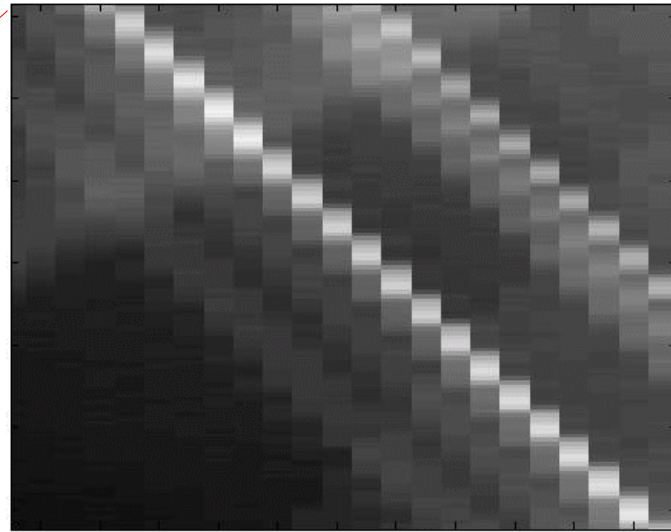
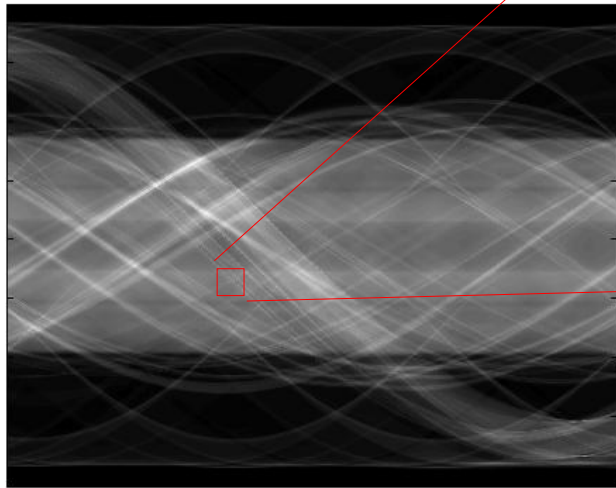
Display Box Plot Avg. Spectrum Delete Box



Aliasing

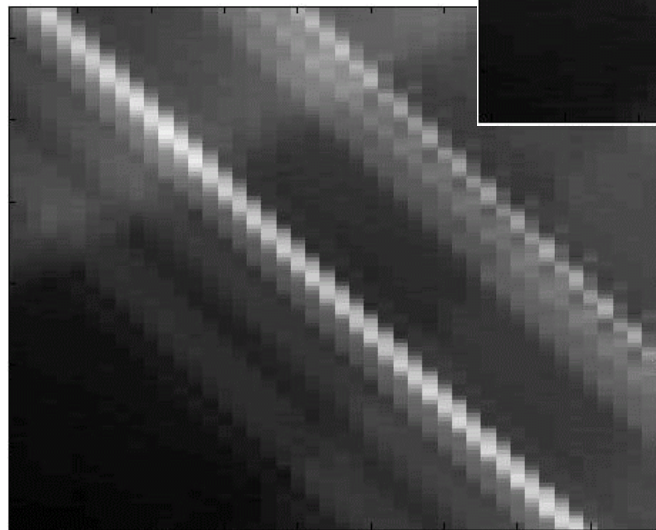
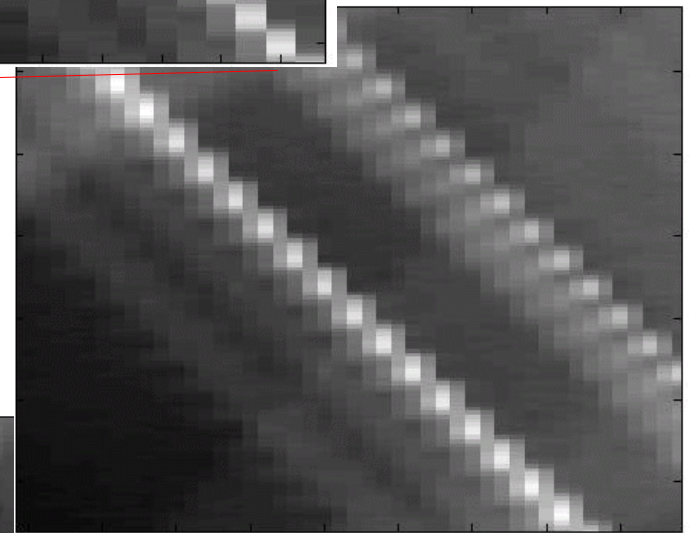
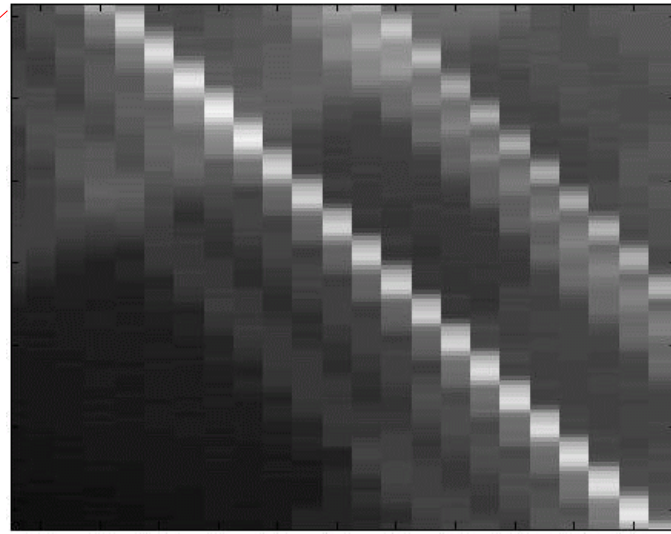
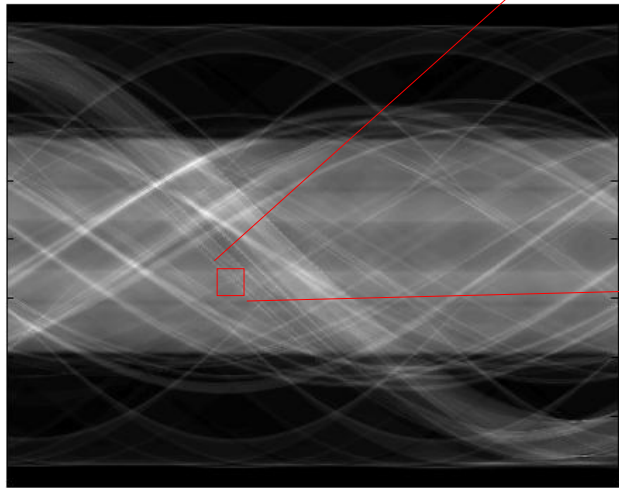






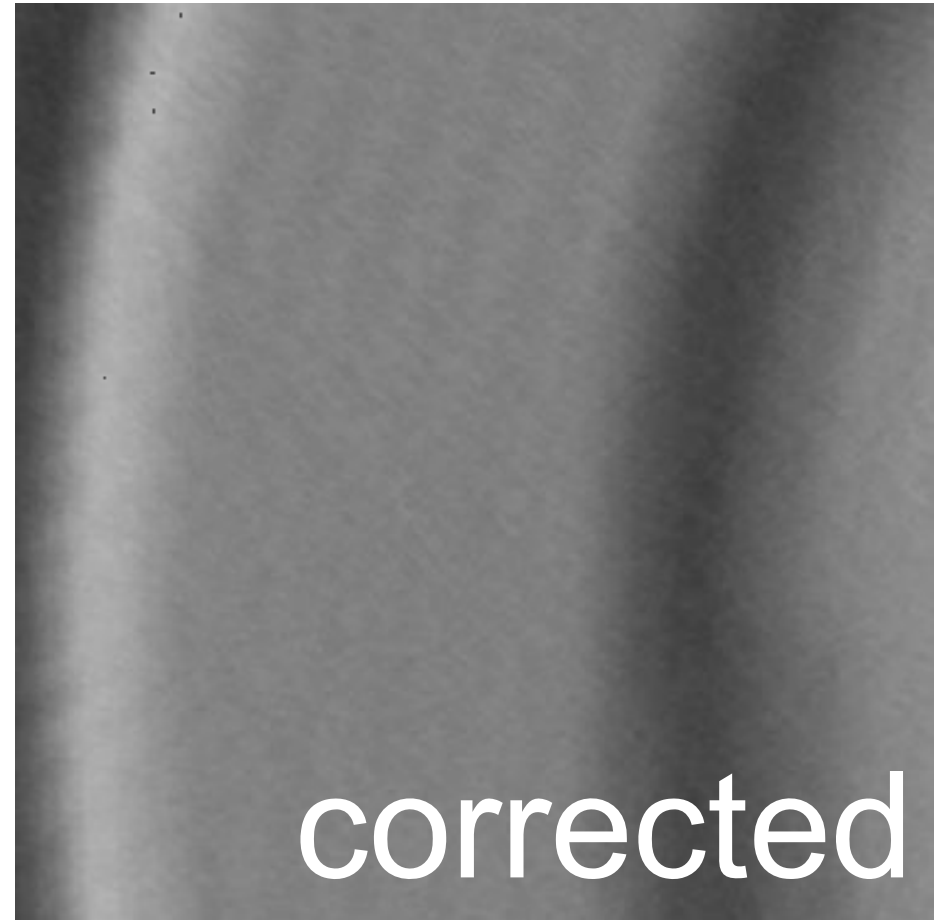
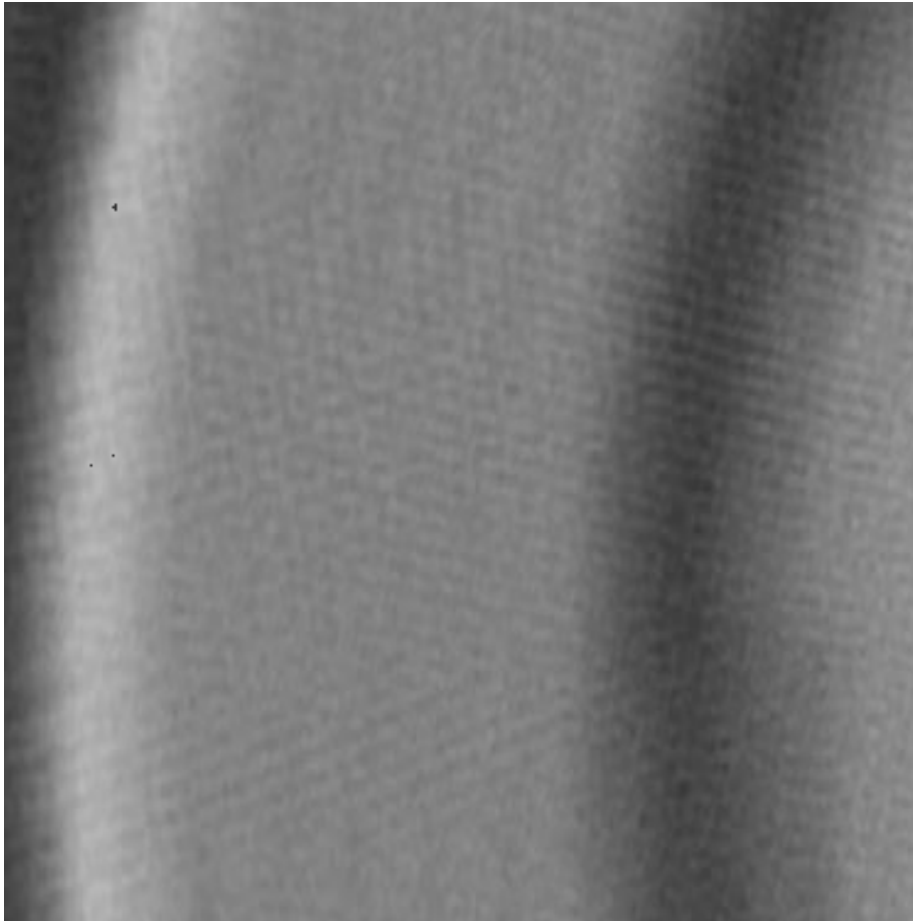
better -

linear
interpolation

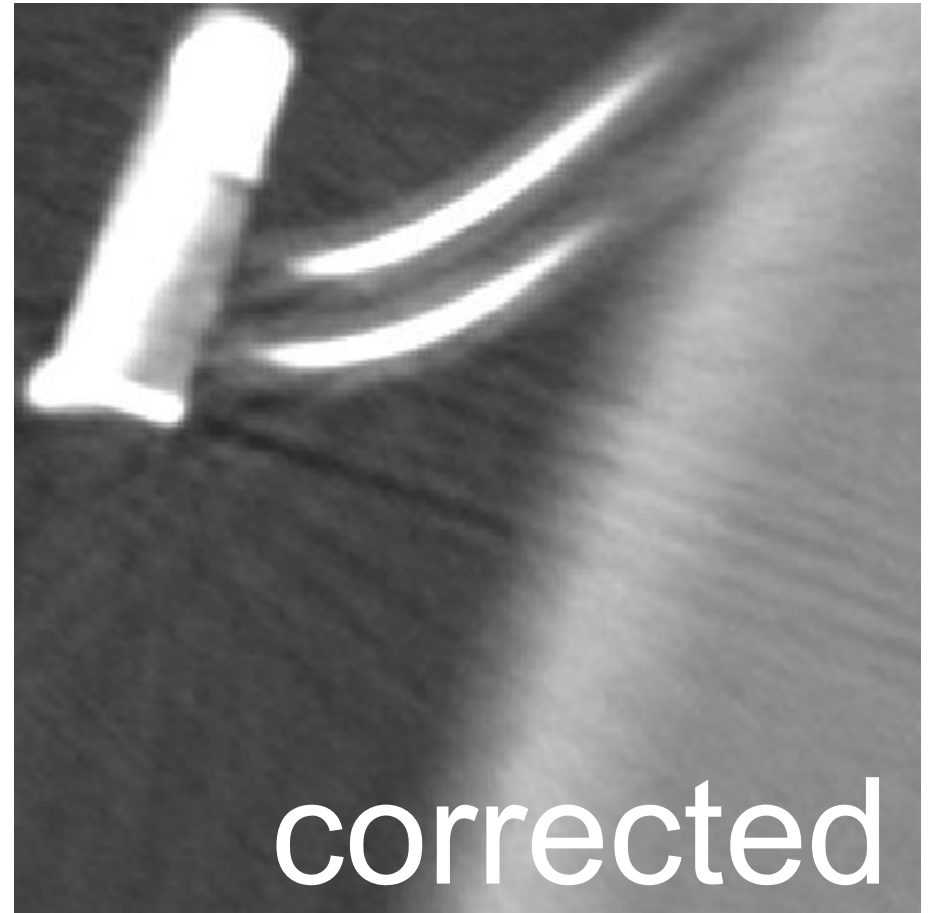
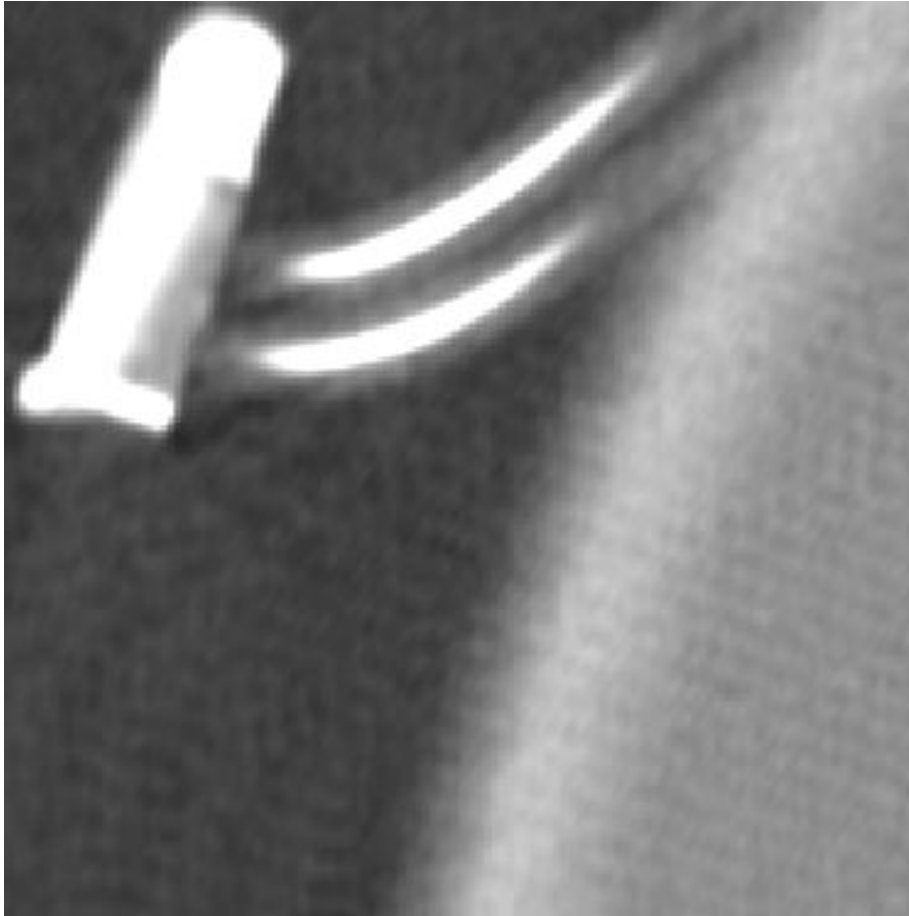


best -
directional
interpolation

Aliasing



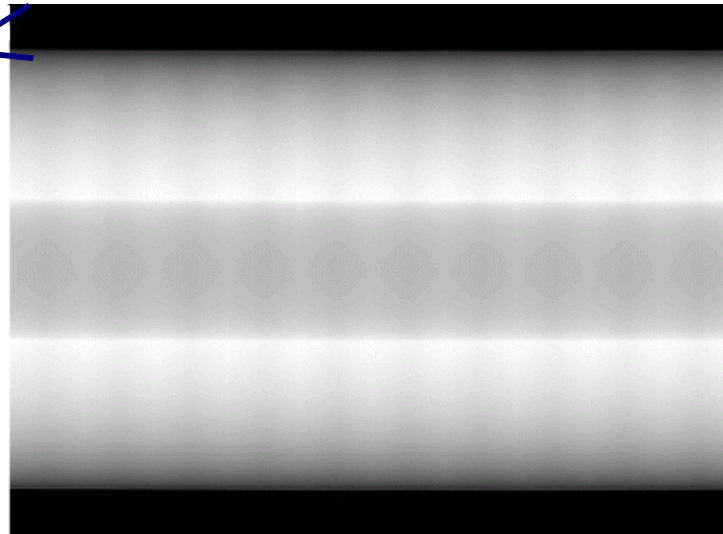
Aliasing



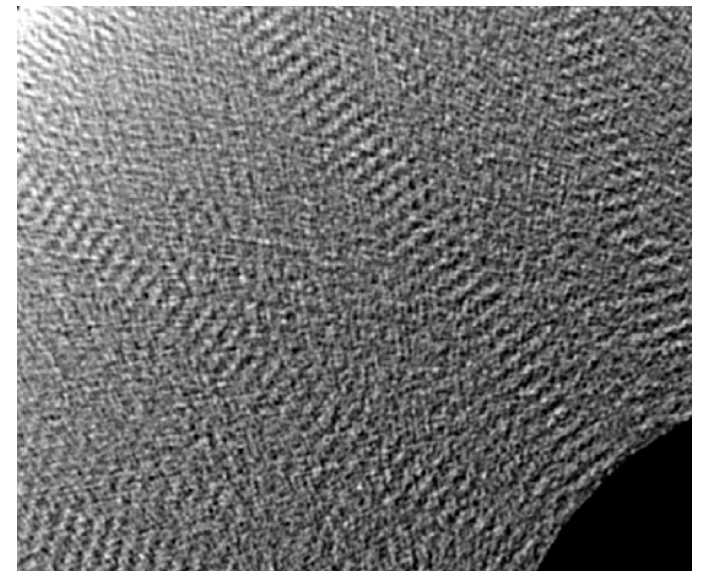
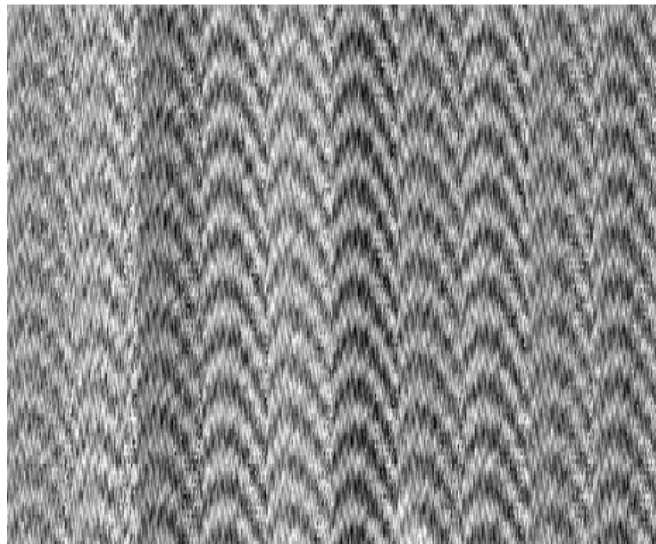
Railroad Track Artifact

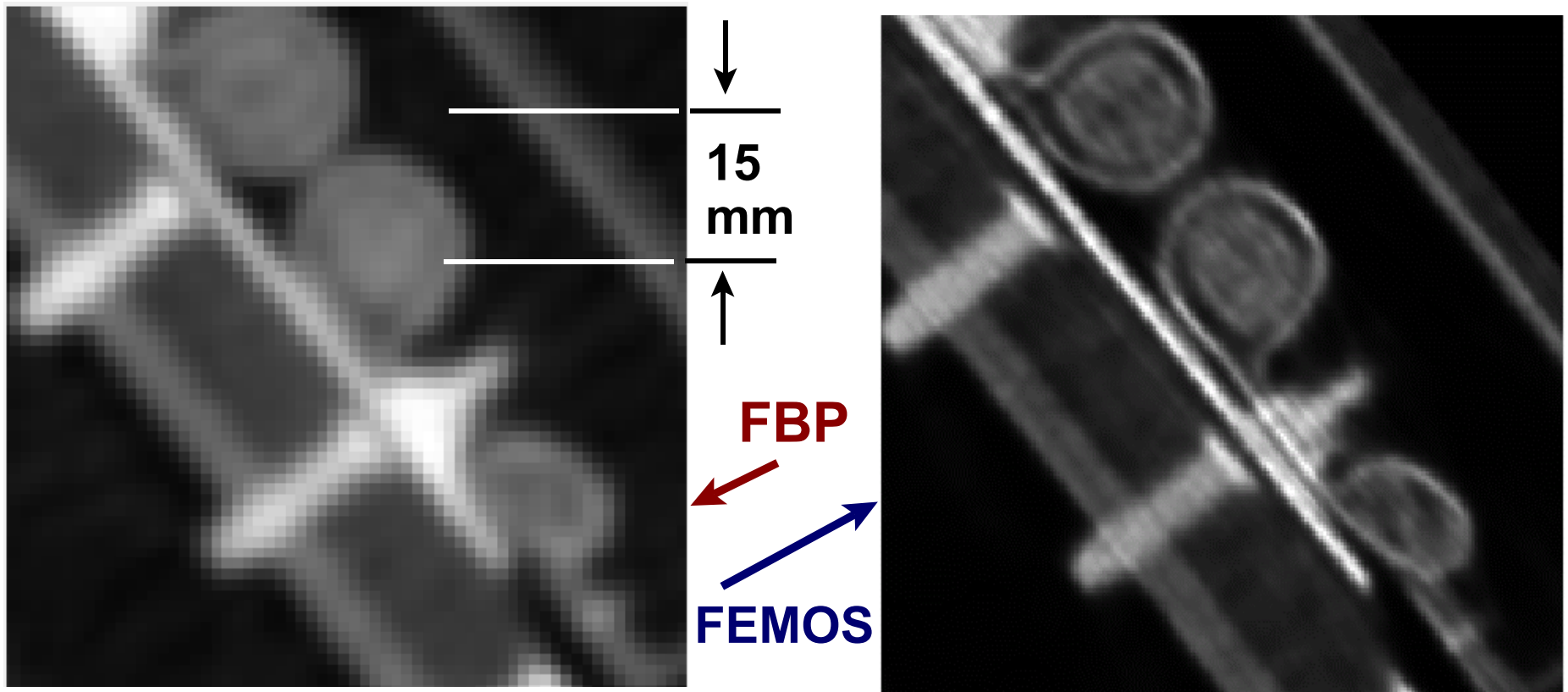
How it affects the sinogram

sinogram

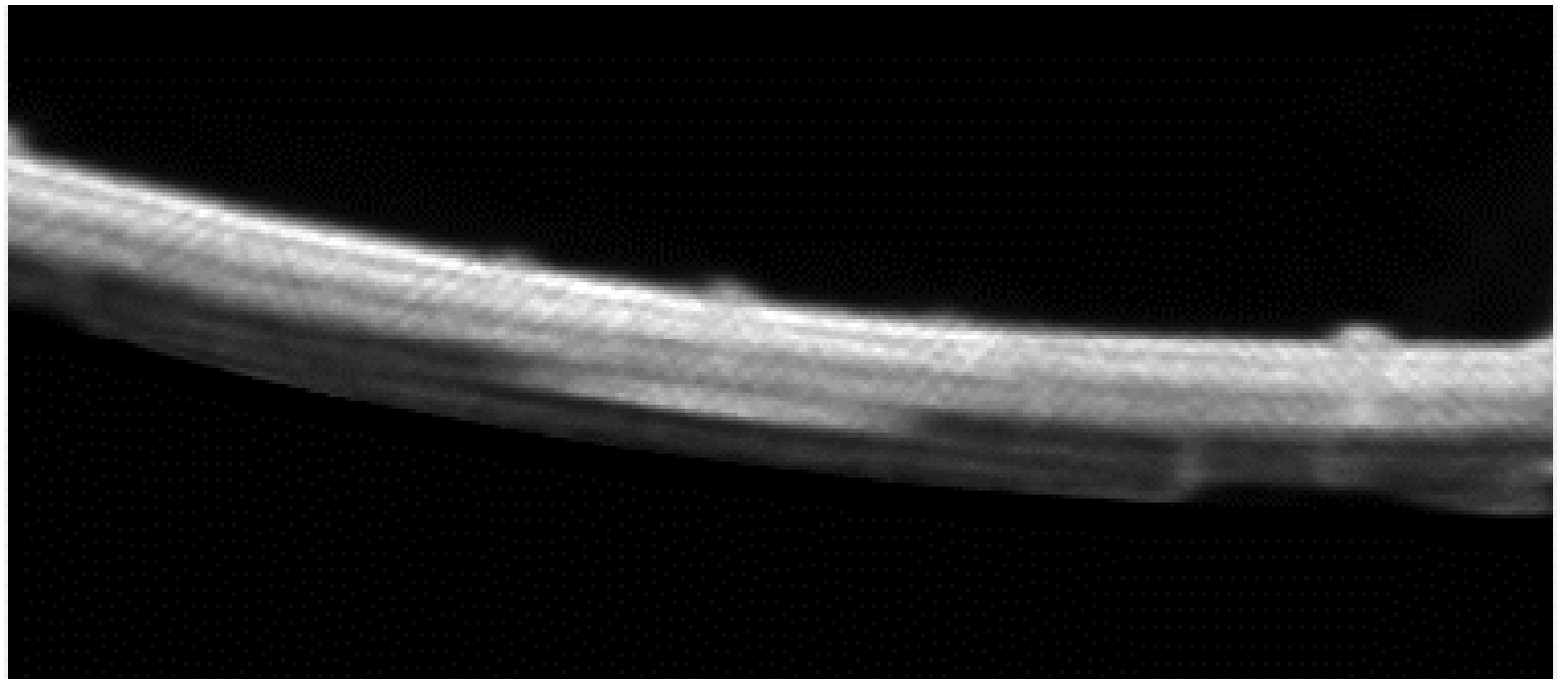
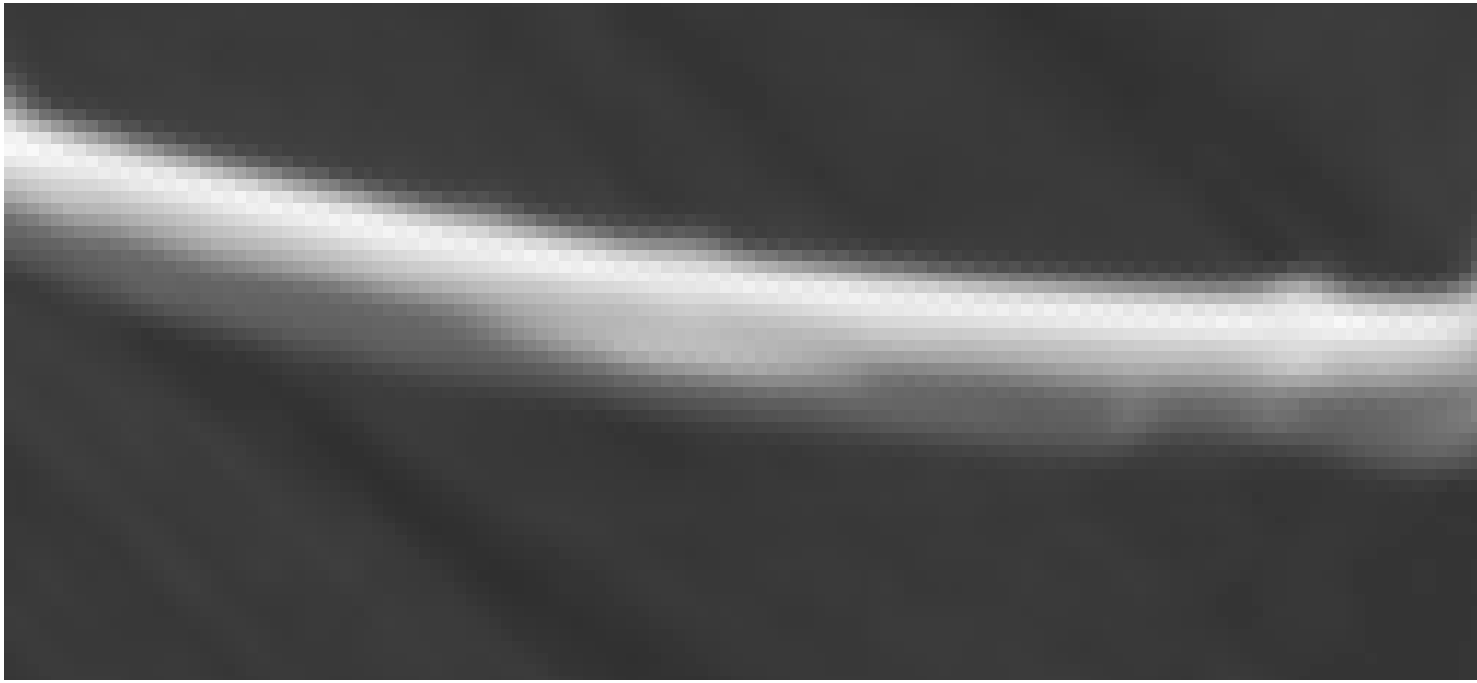


image

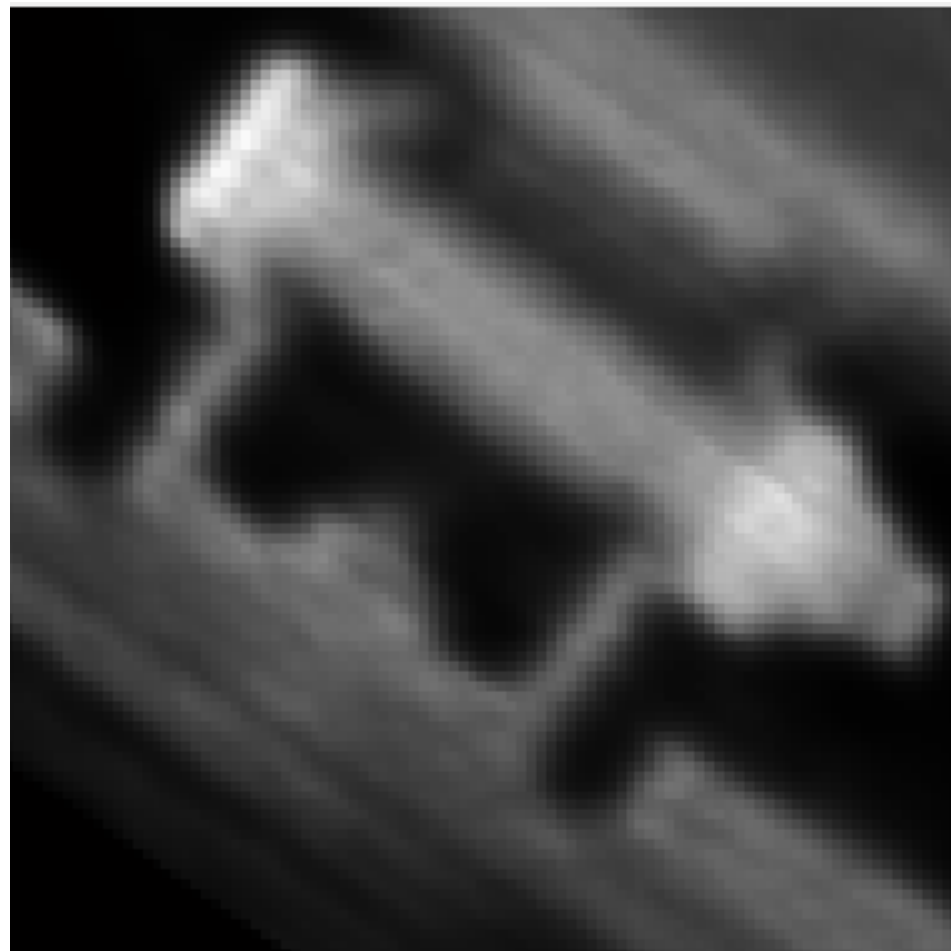
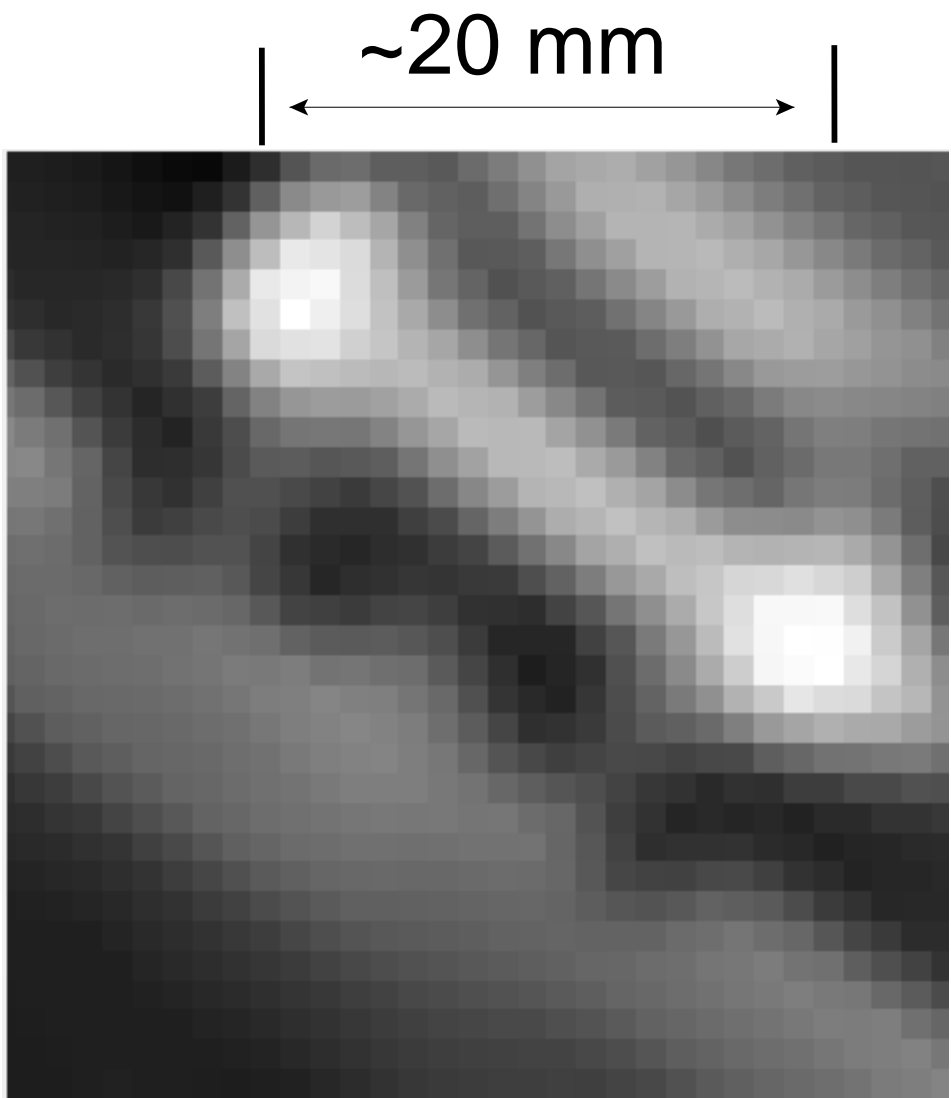


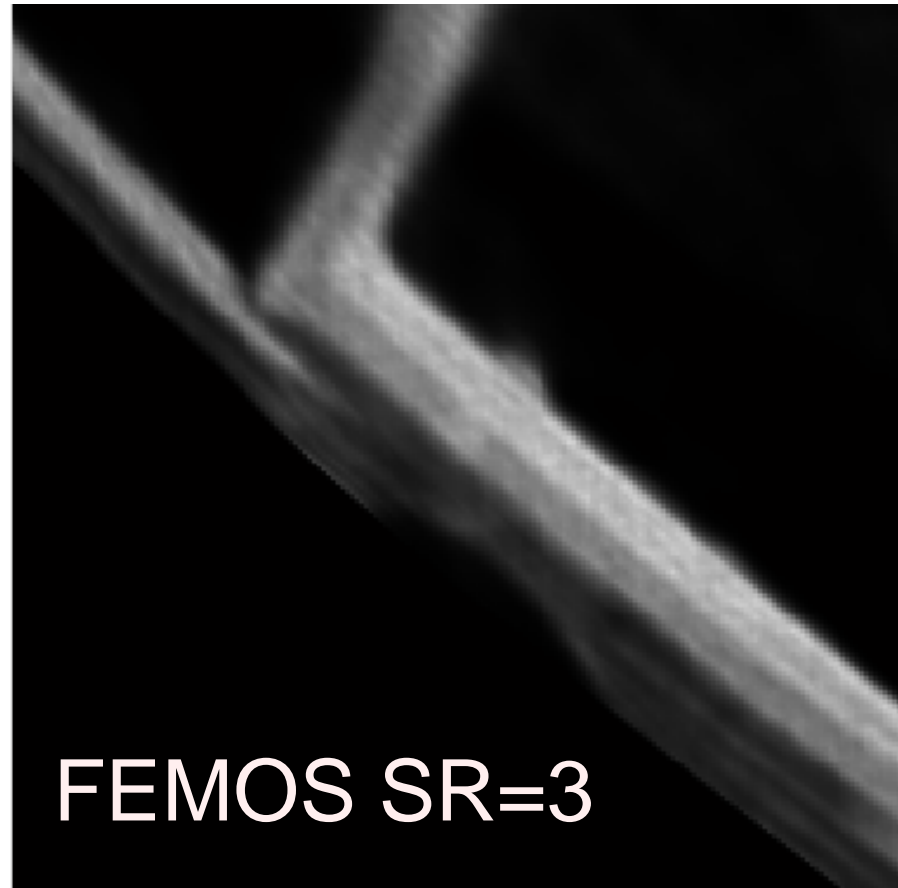
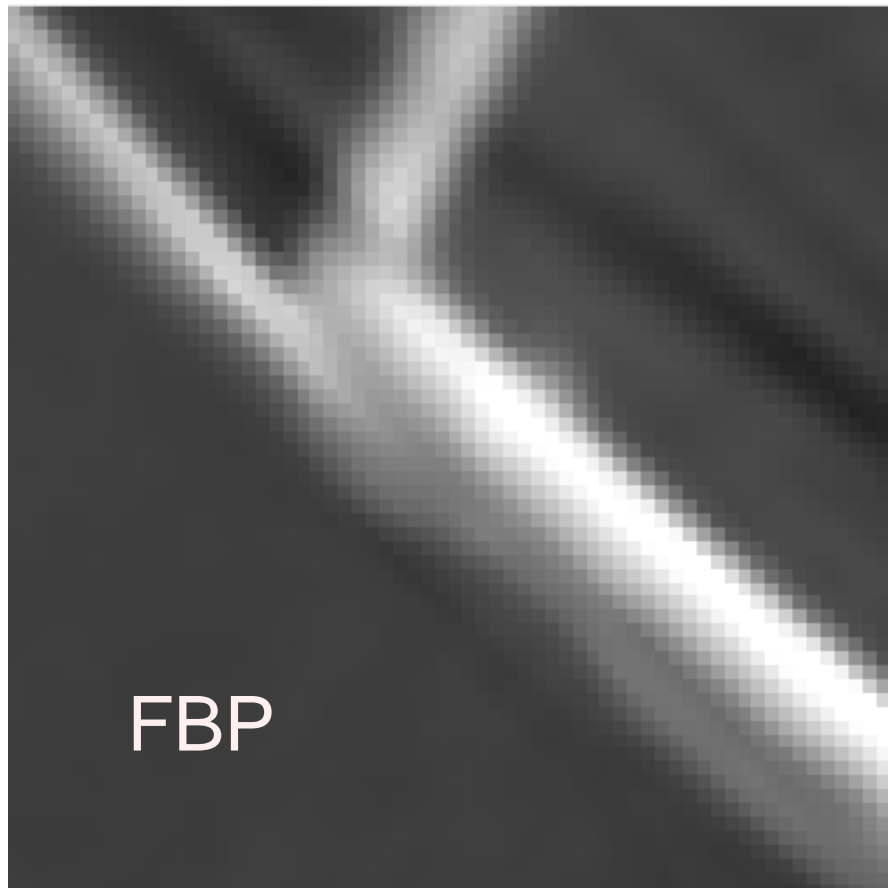


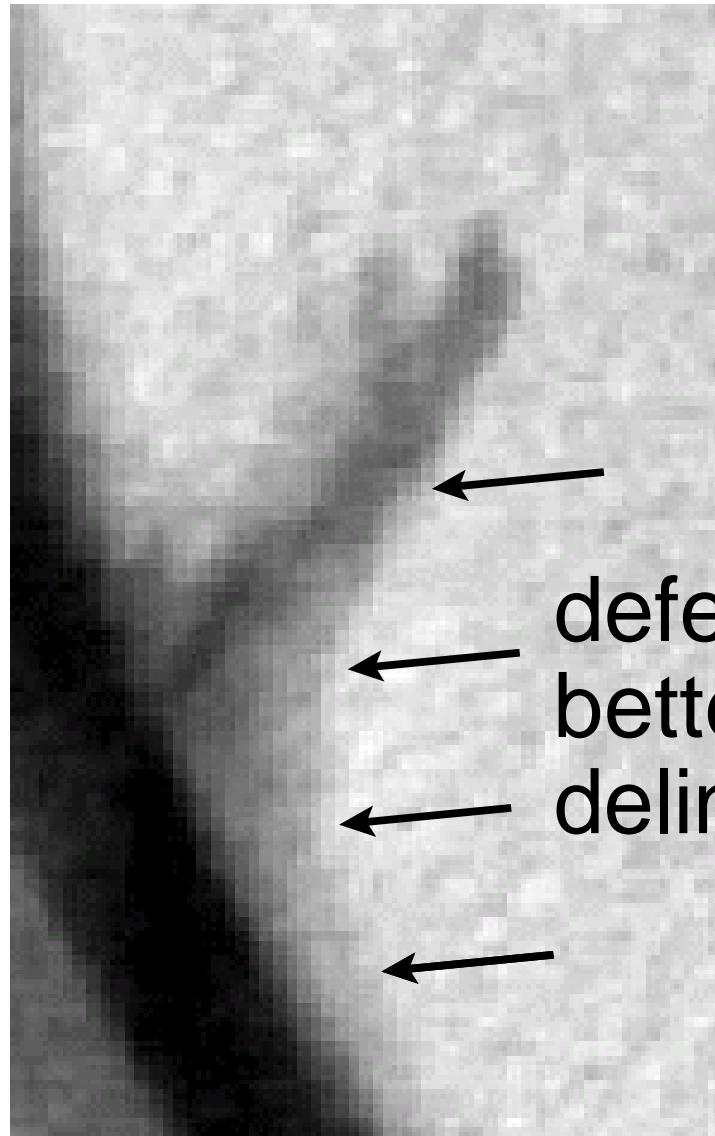
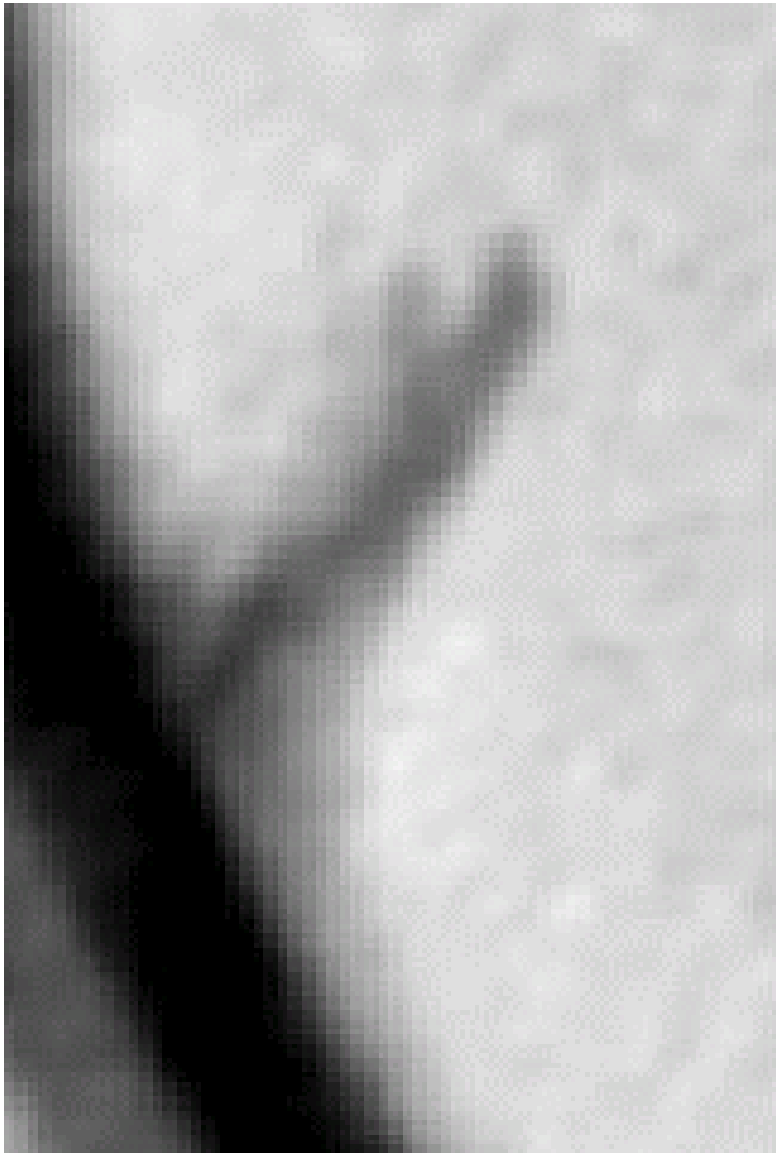
Resolving power enhancement



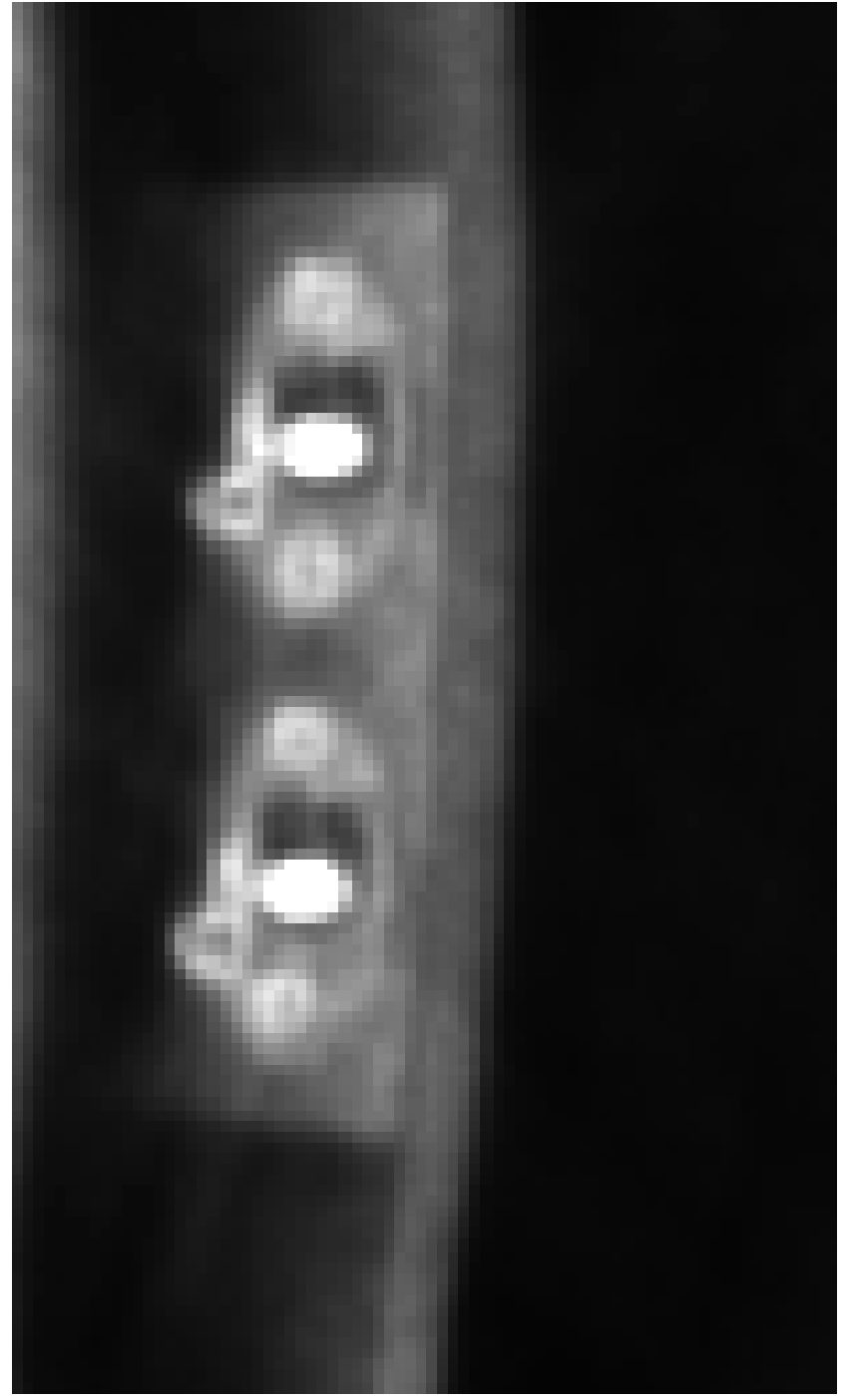
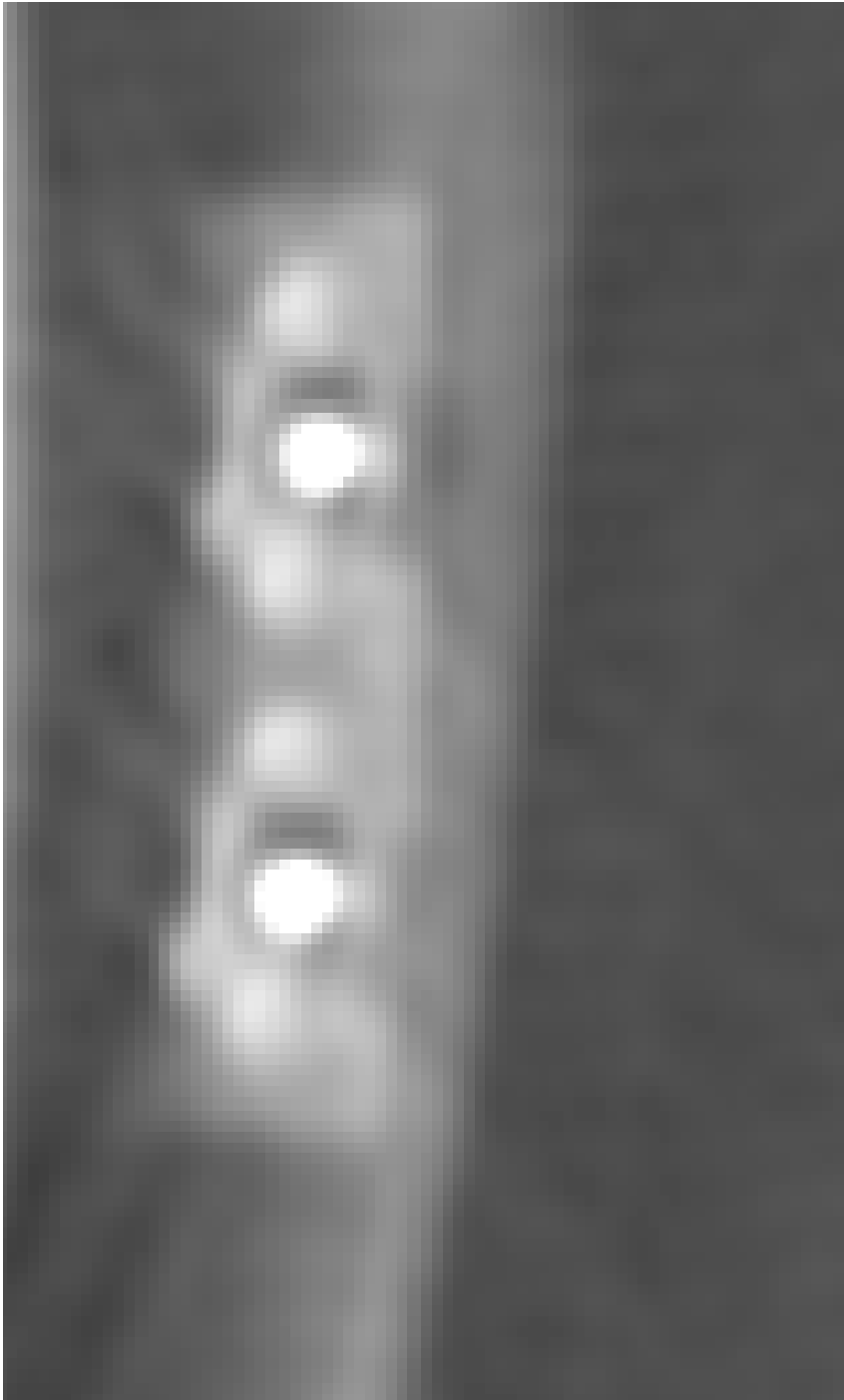
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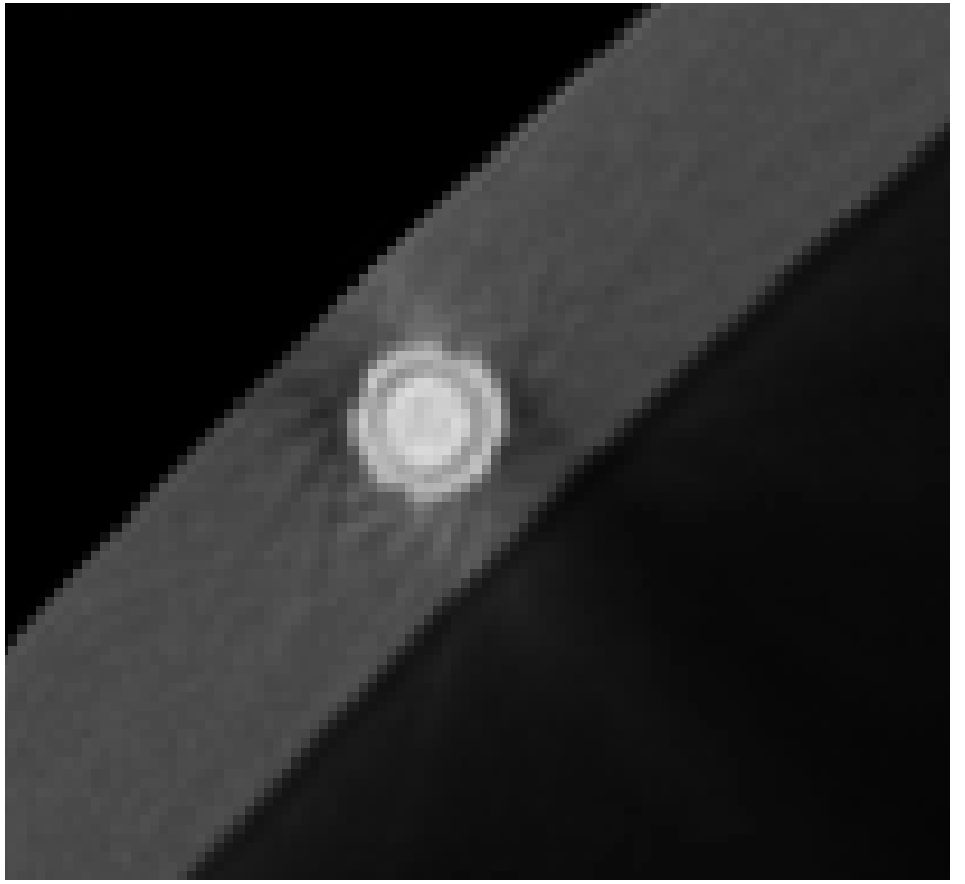
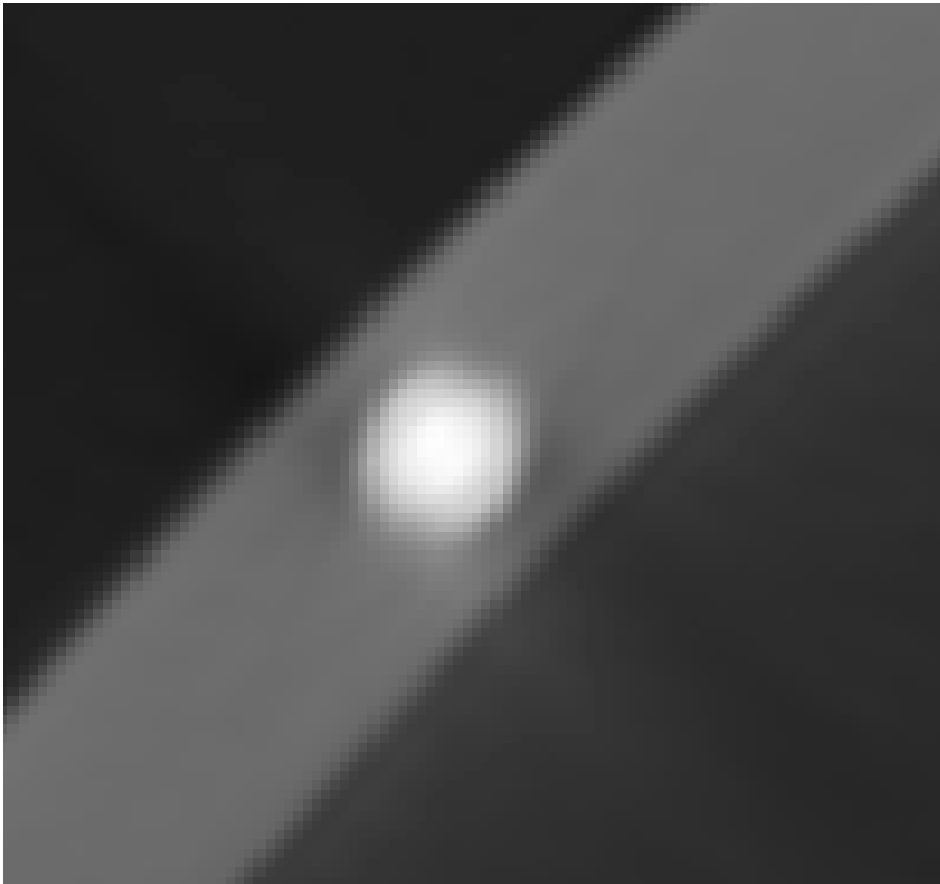




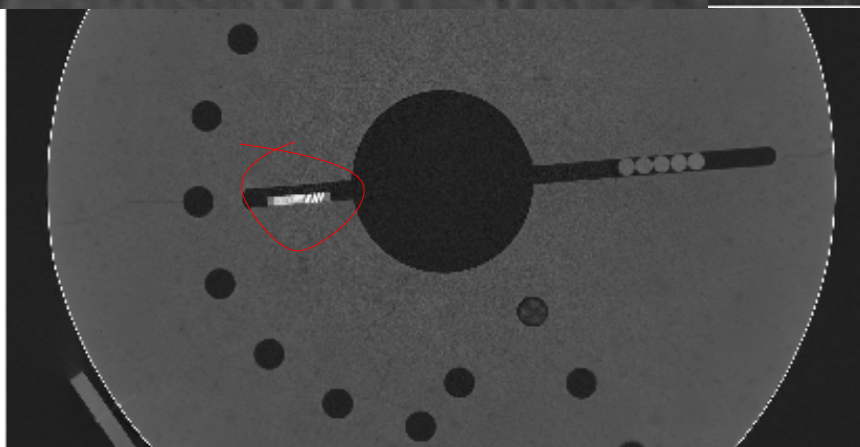
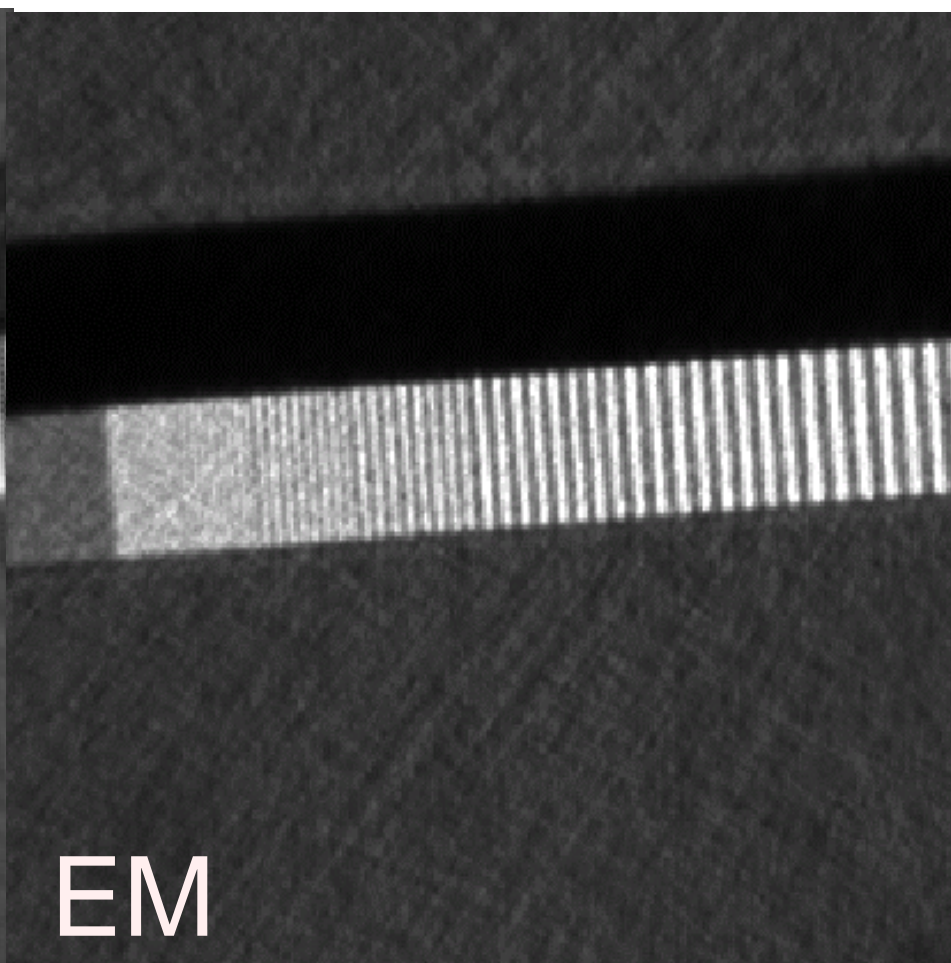
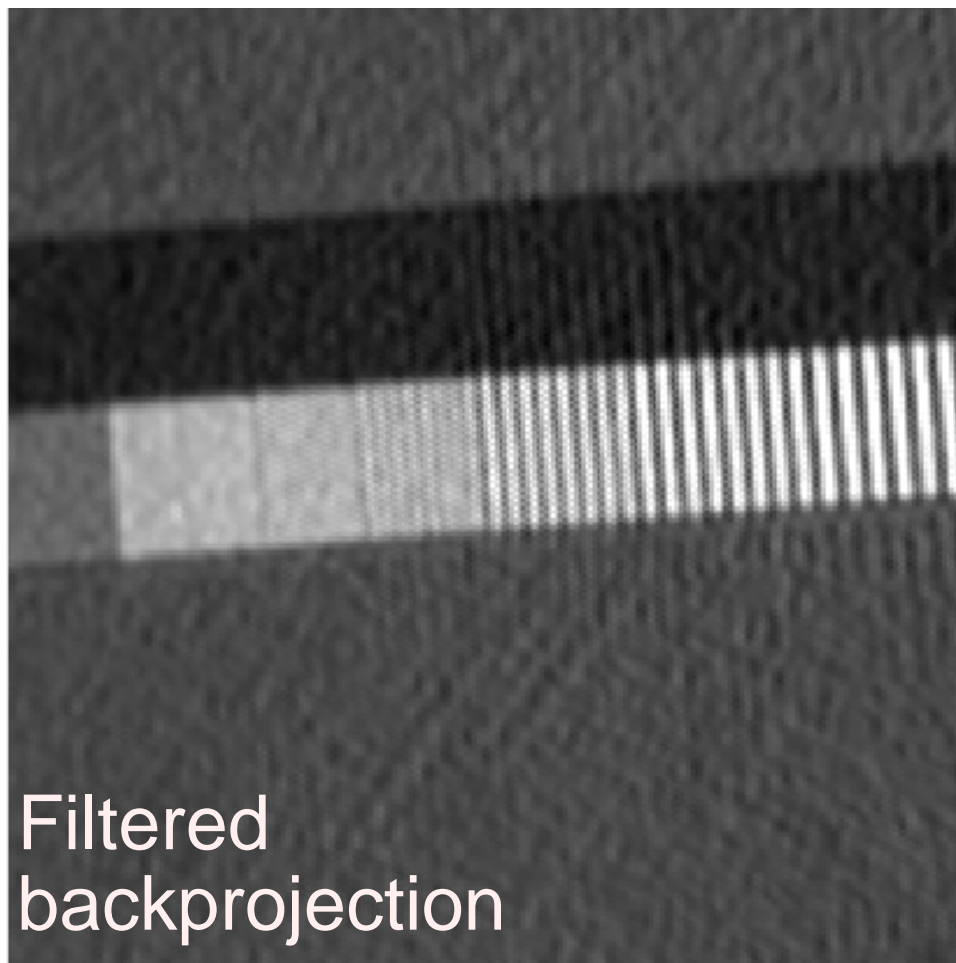
defects
better
delineated

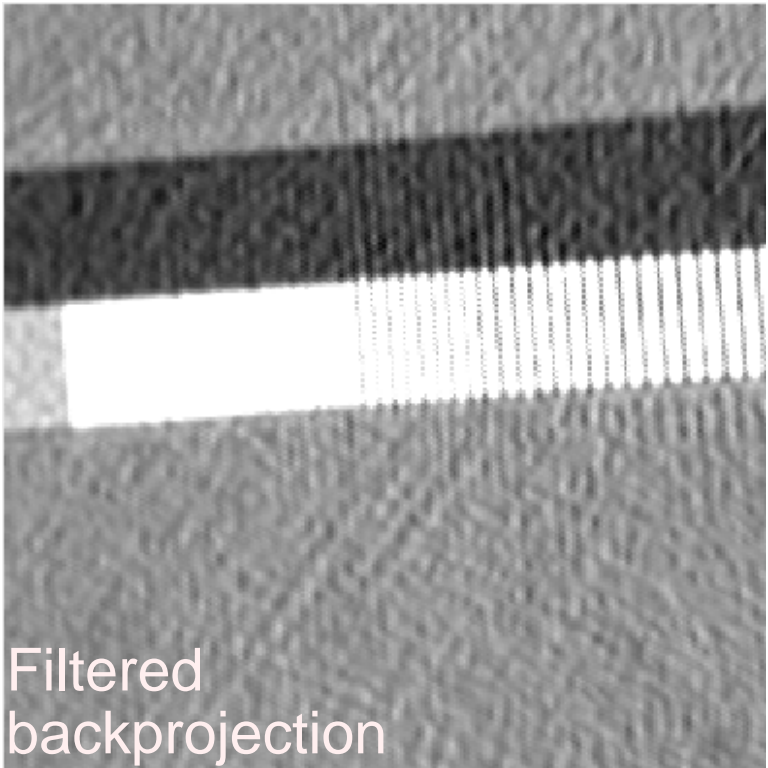


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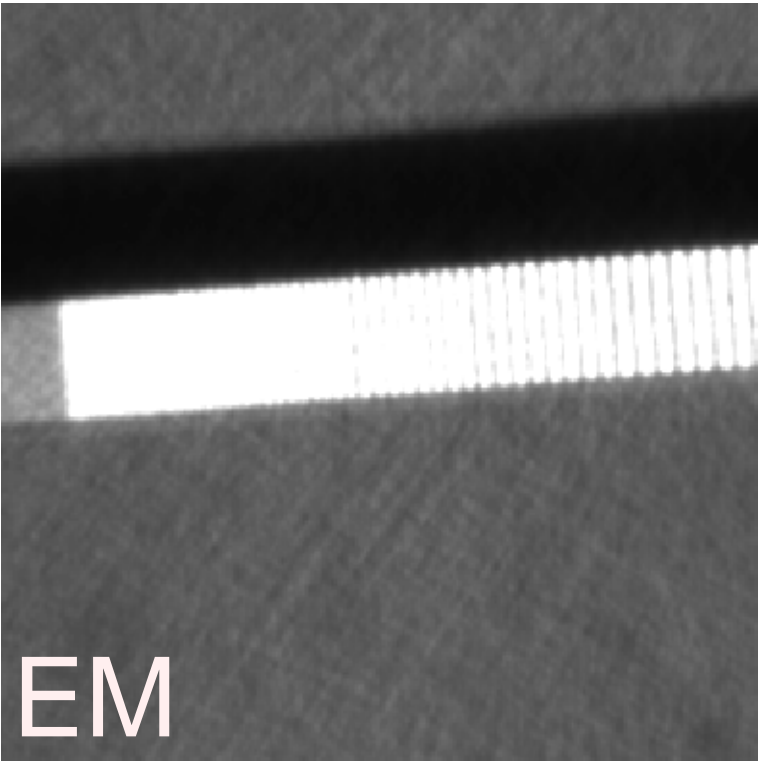


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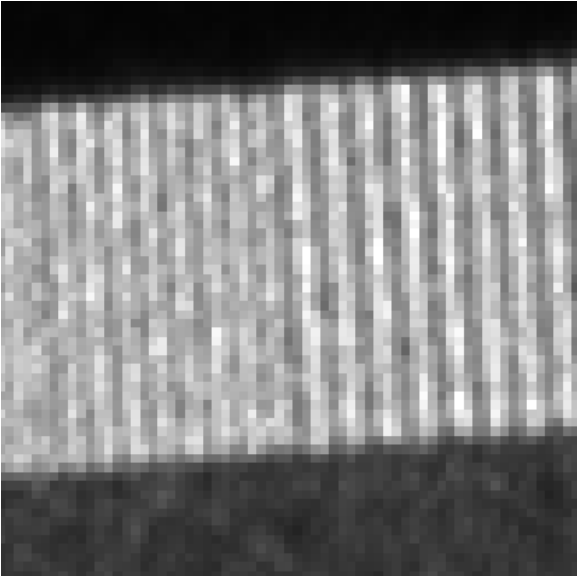
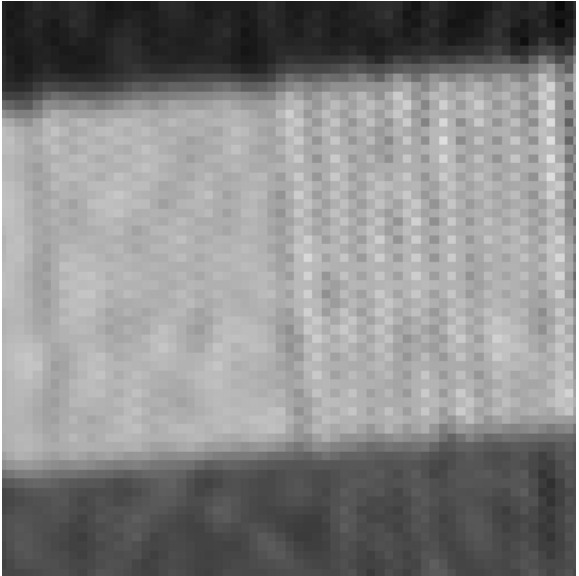


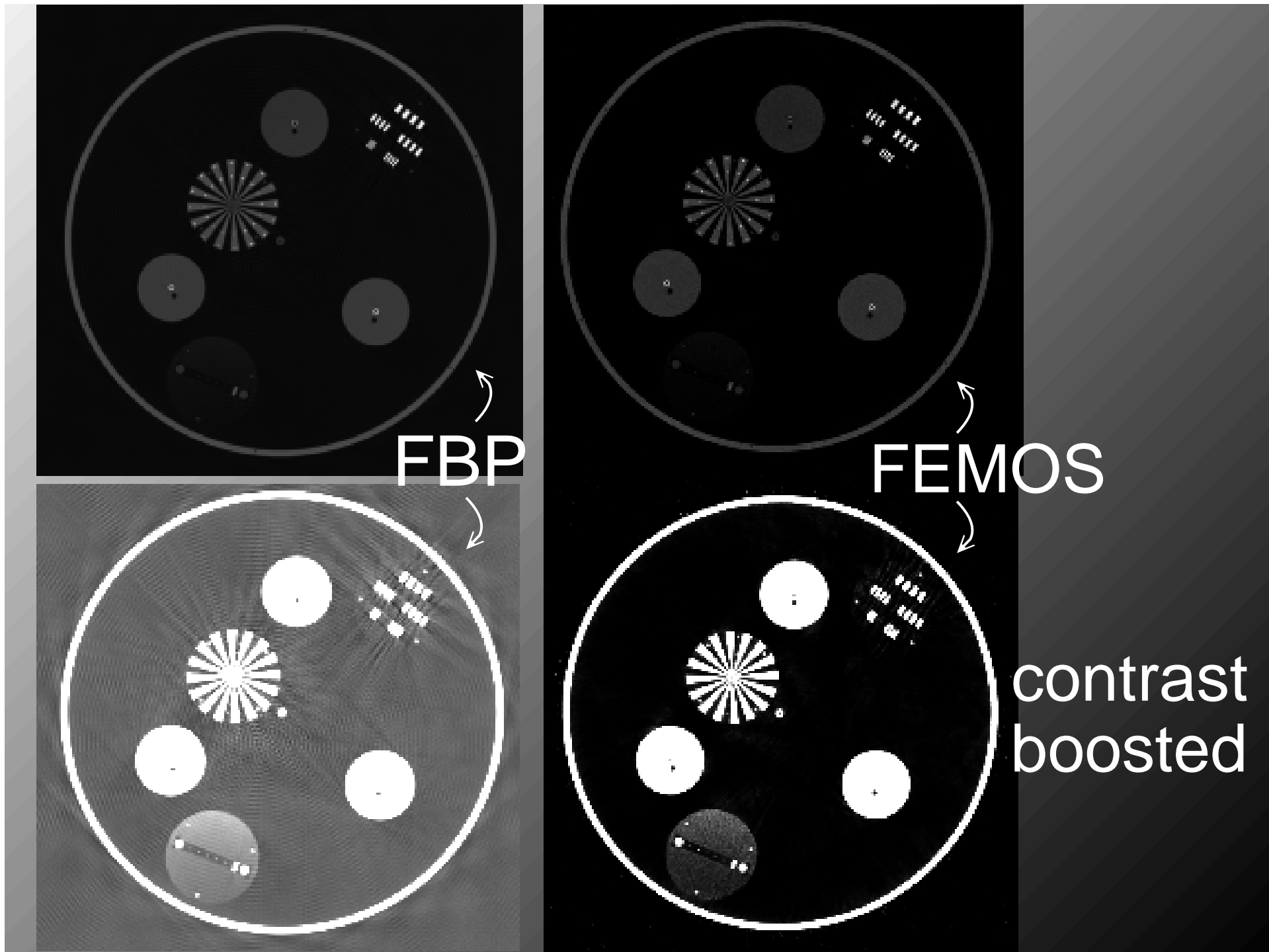


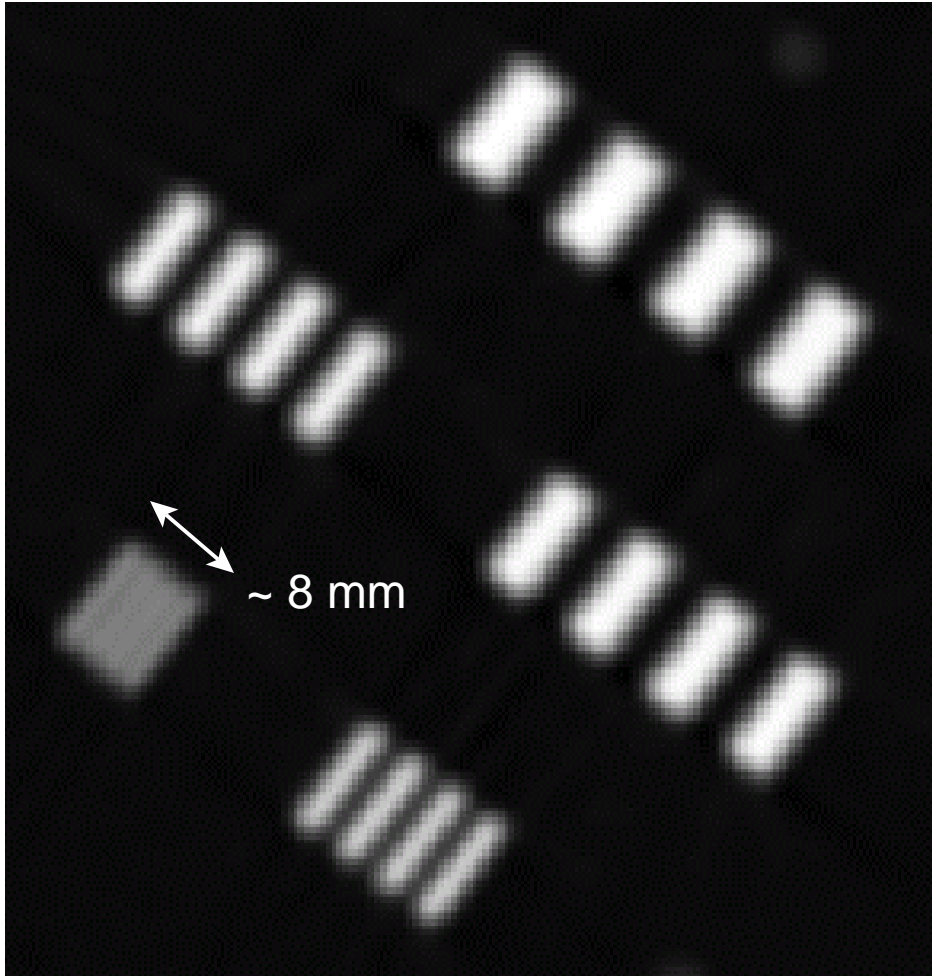
Filtered
backprojection



EM

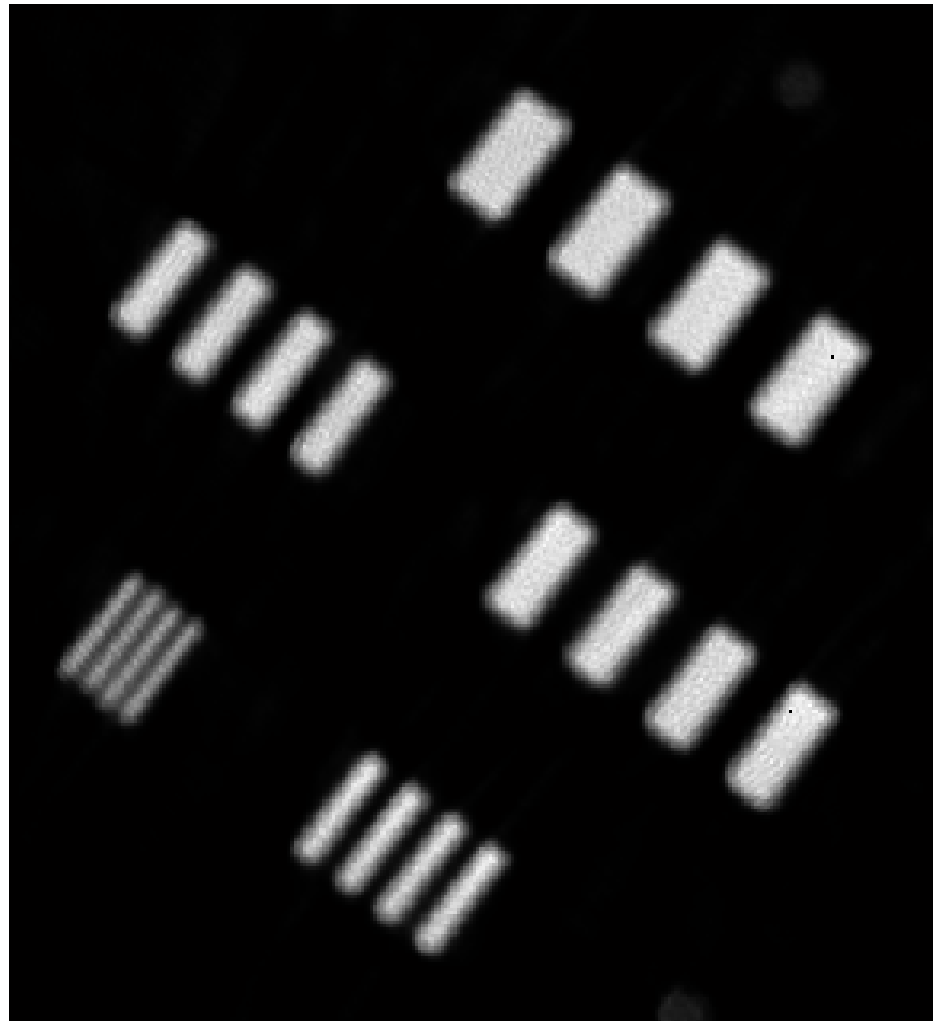


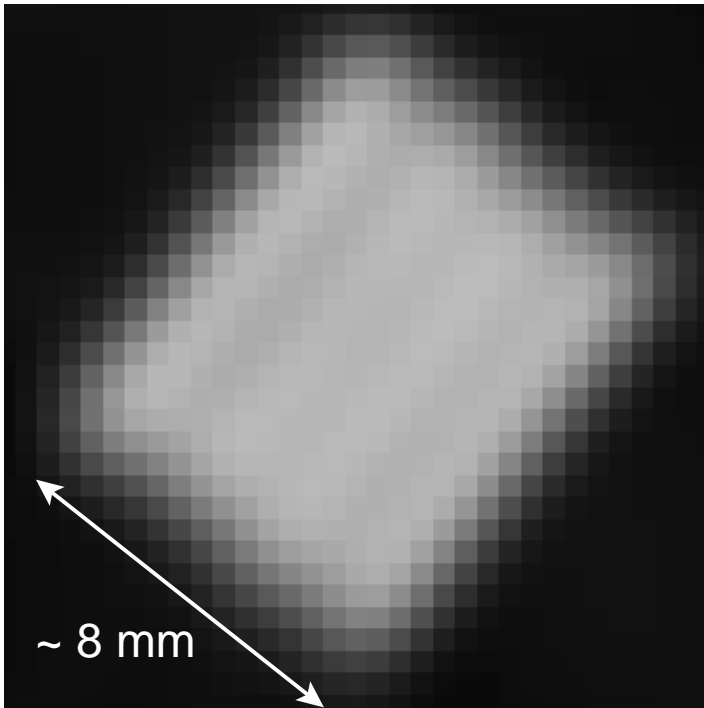




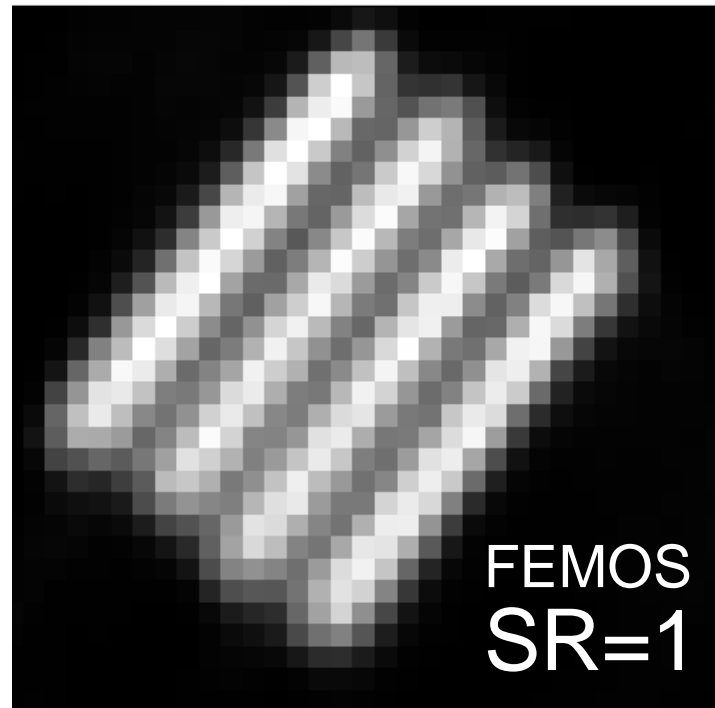
FBP

FEMOS

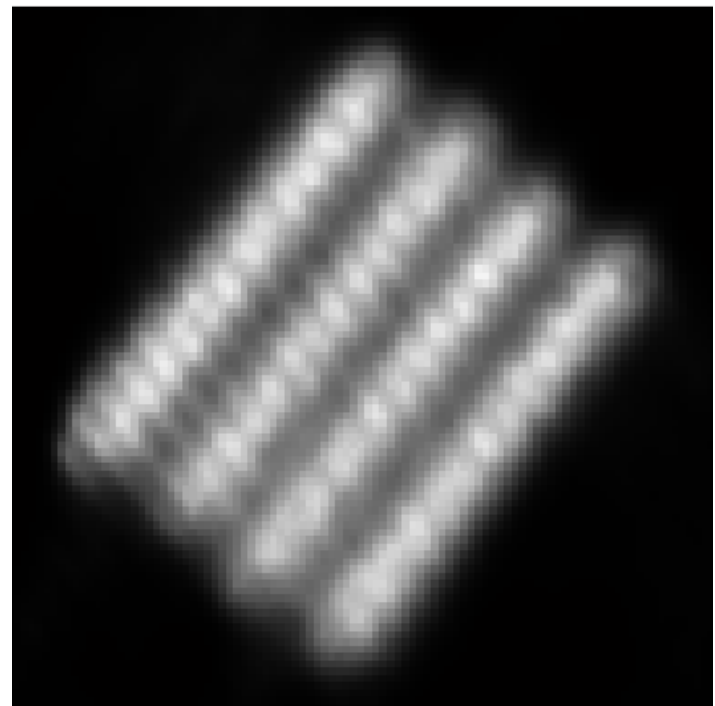




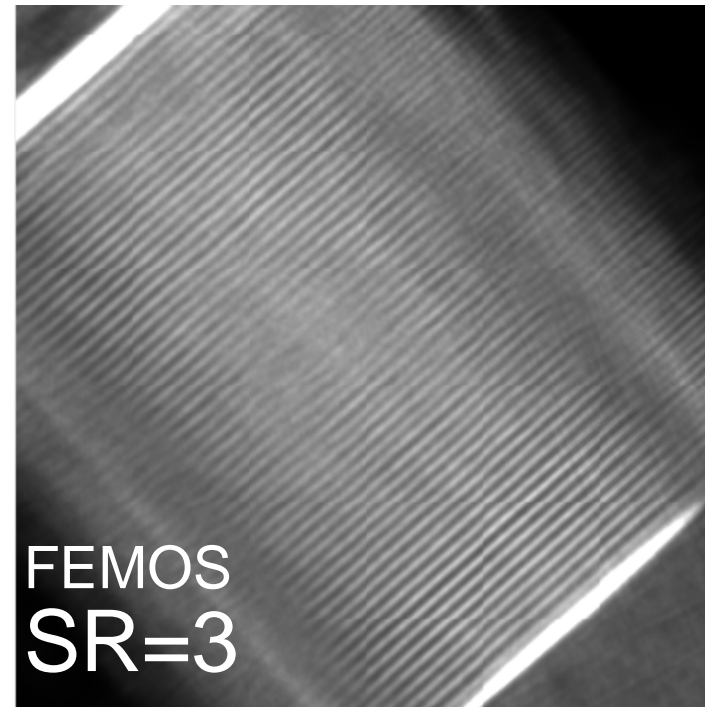
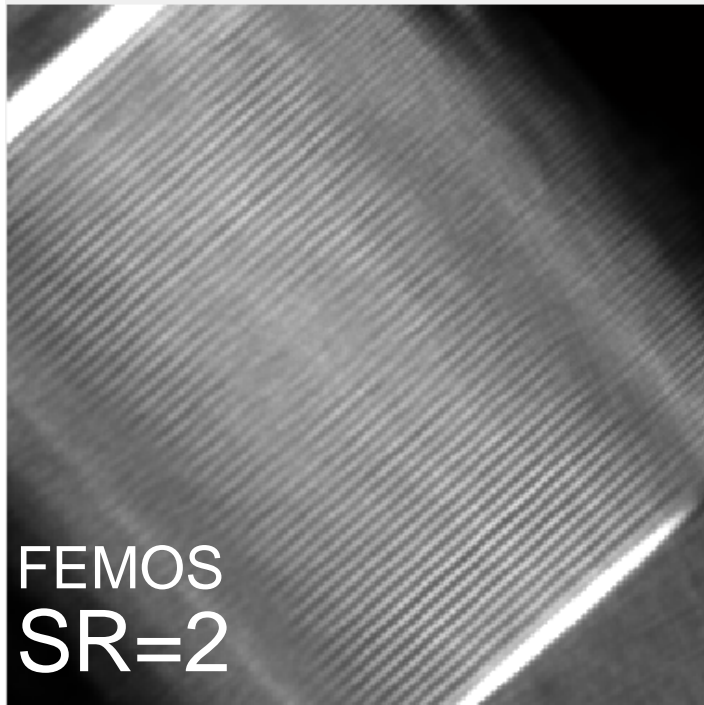
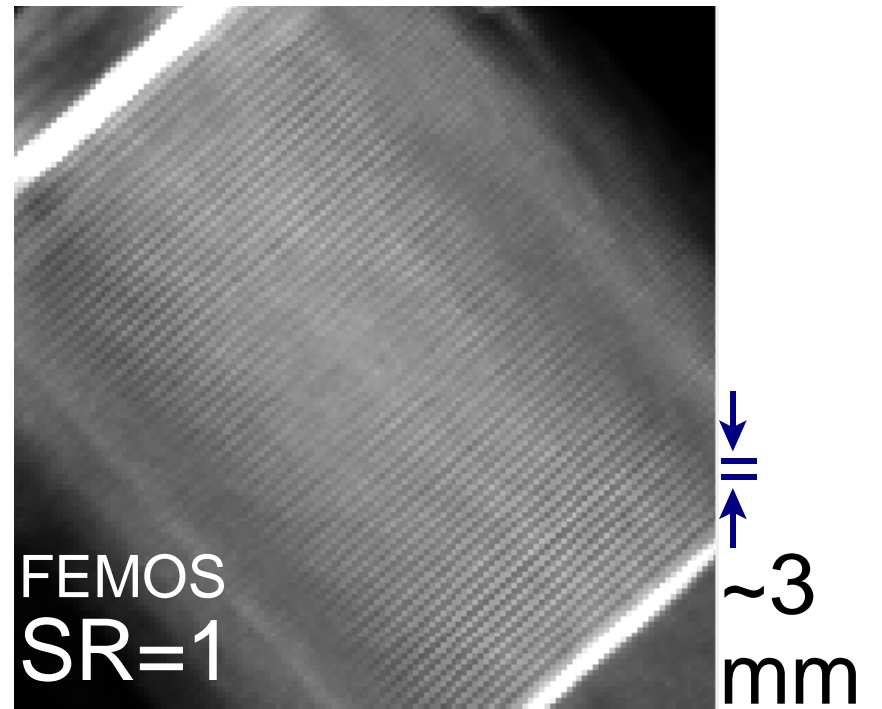
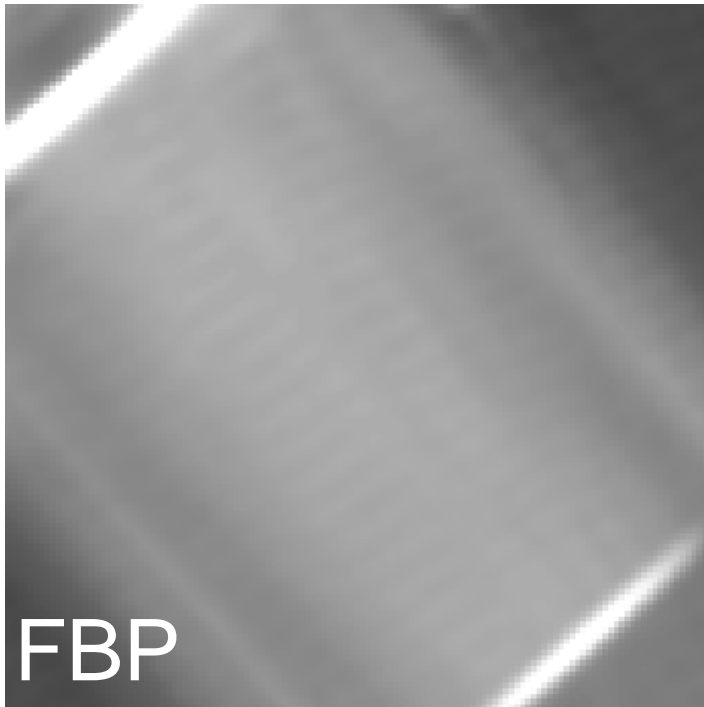
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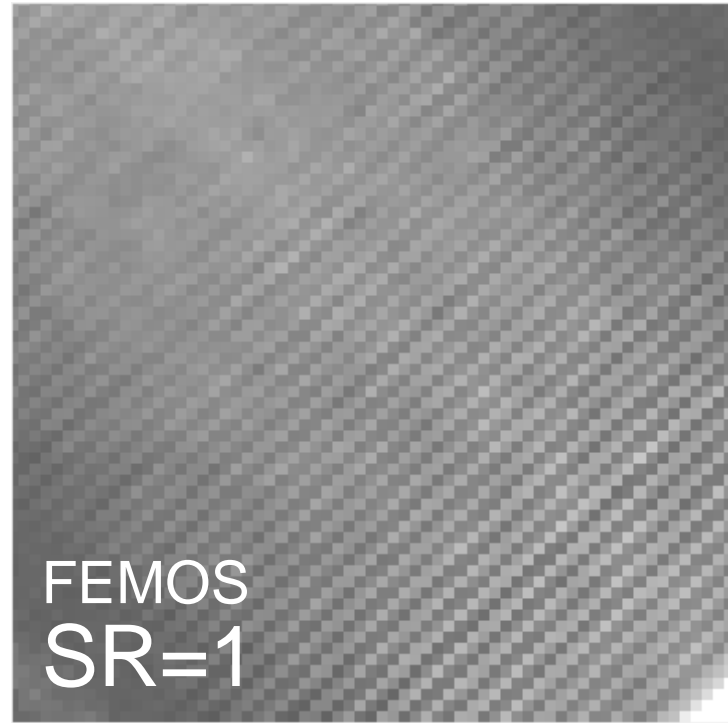
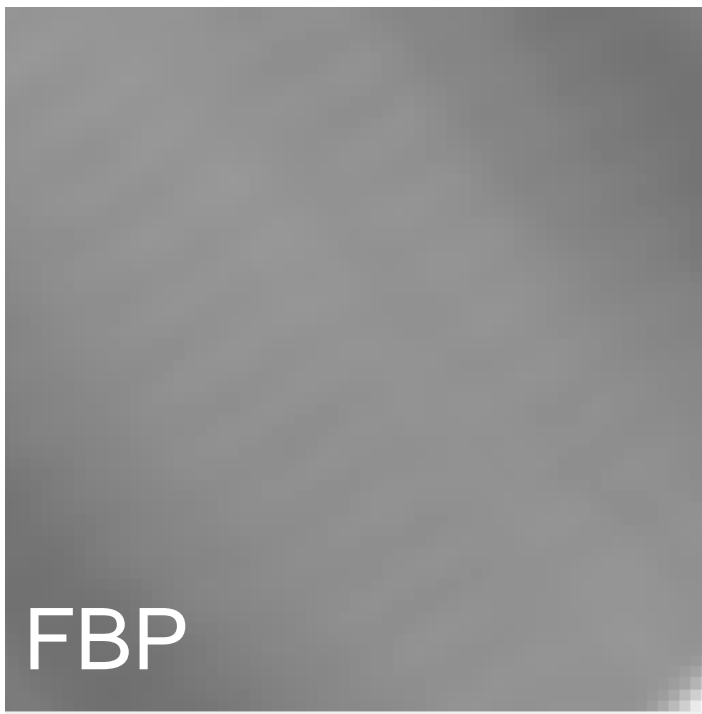


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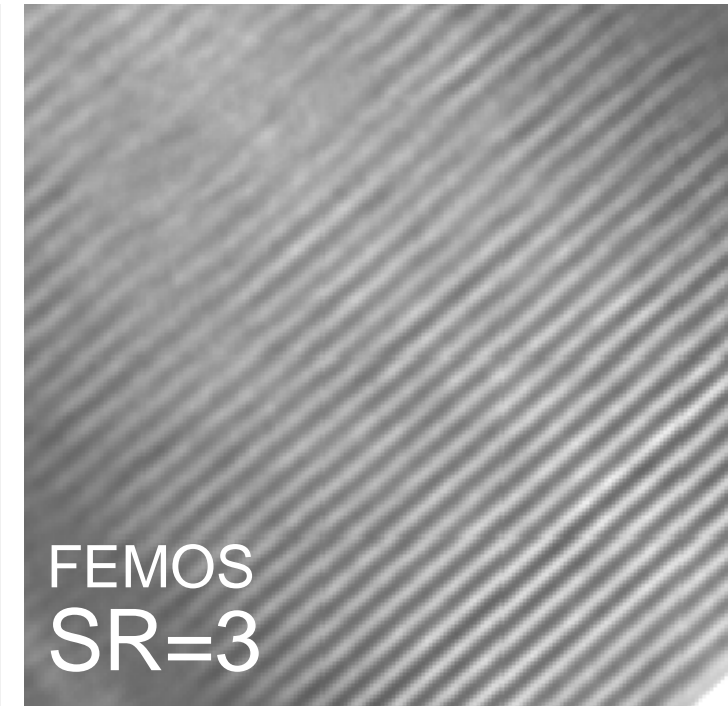
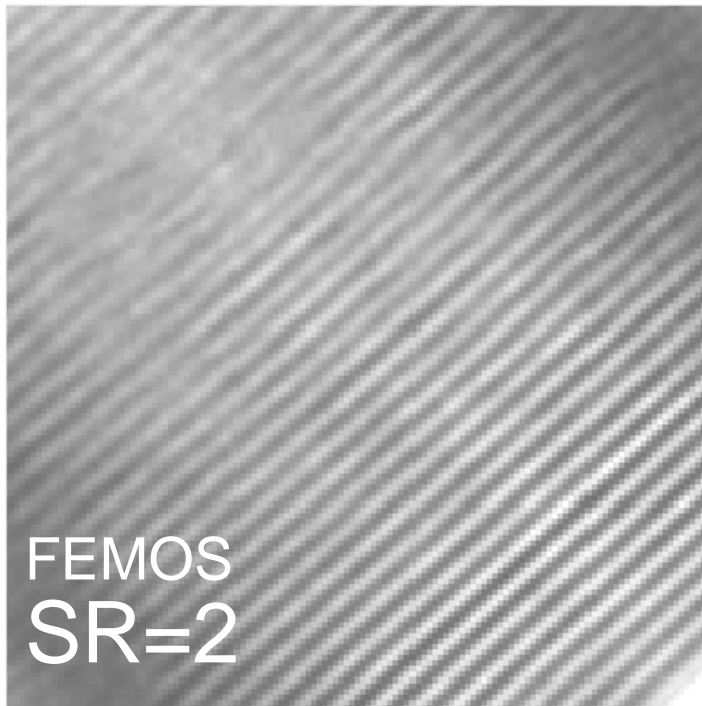


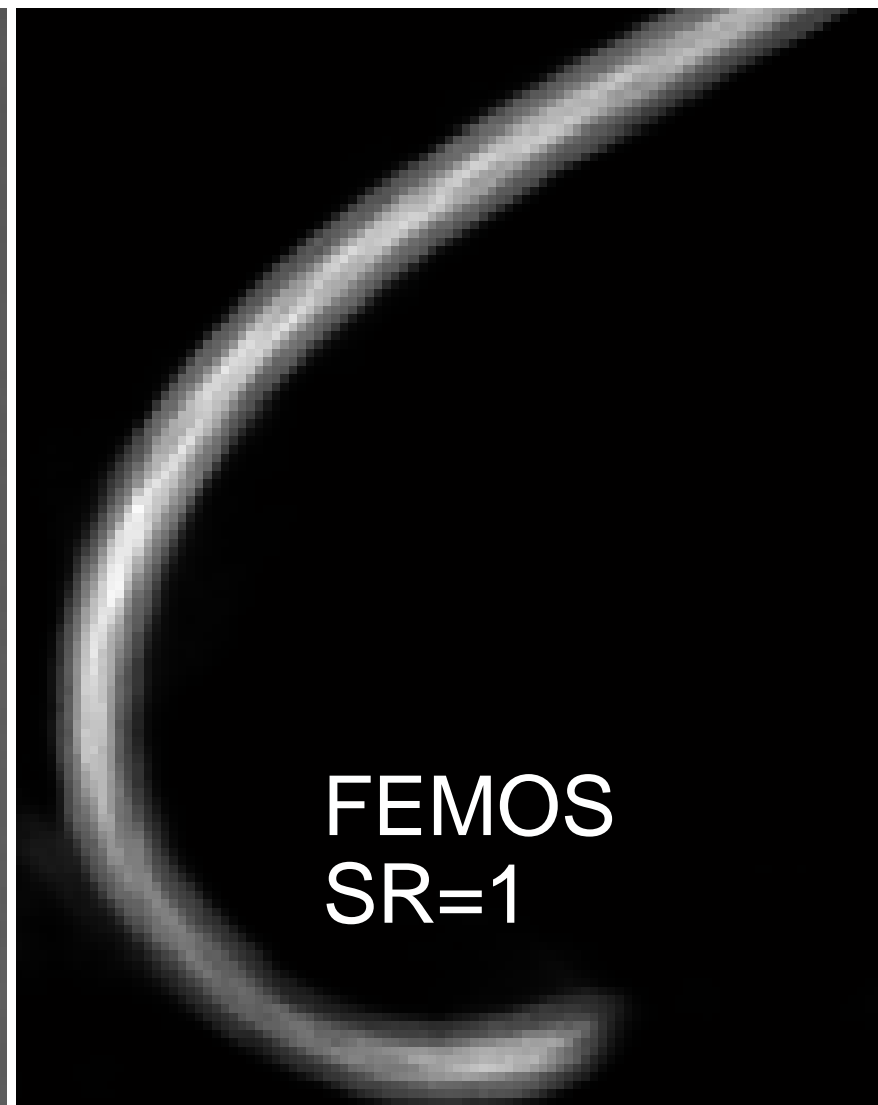
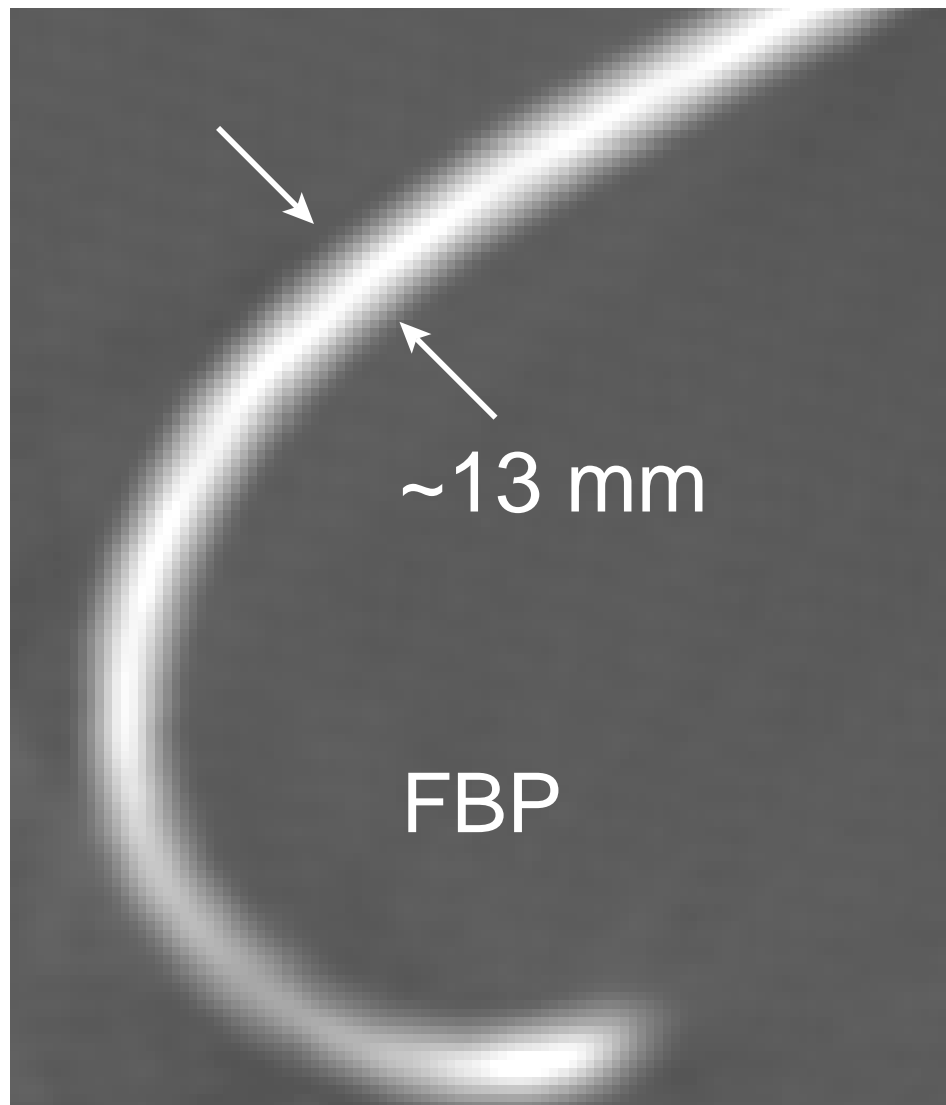
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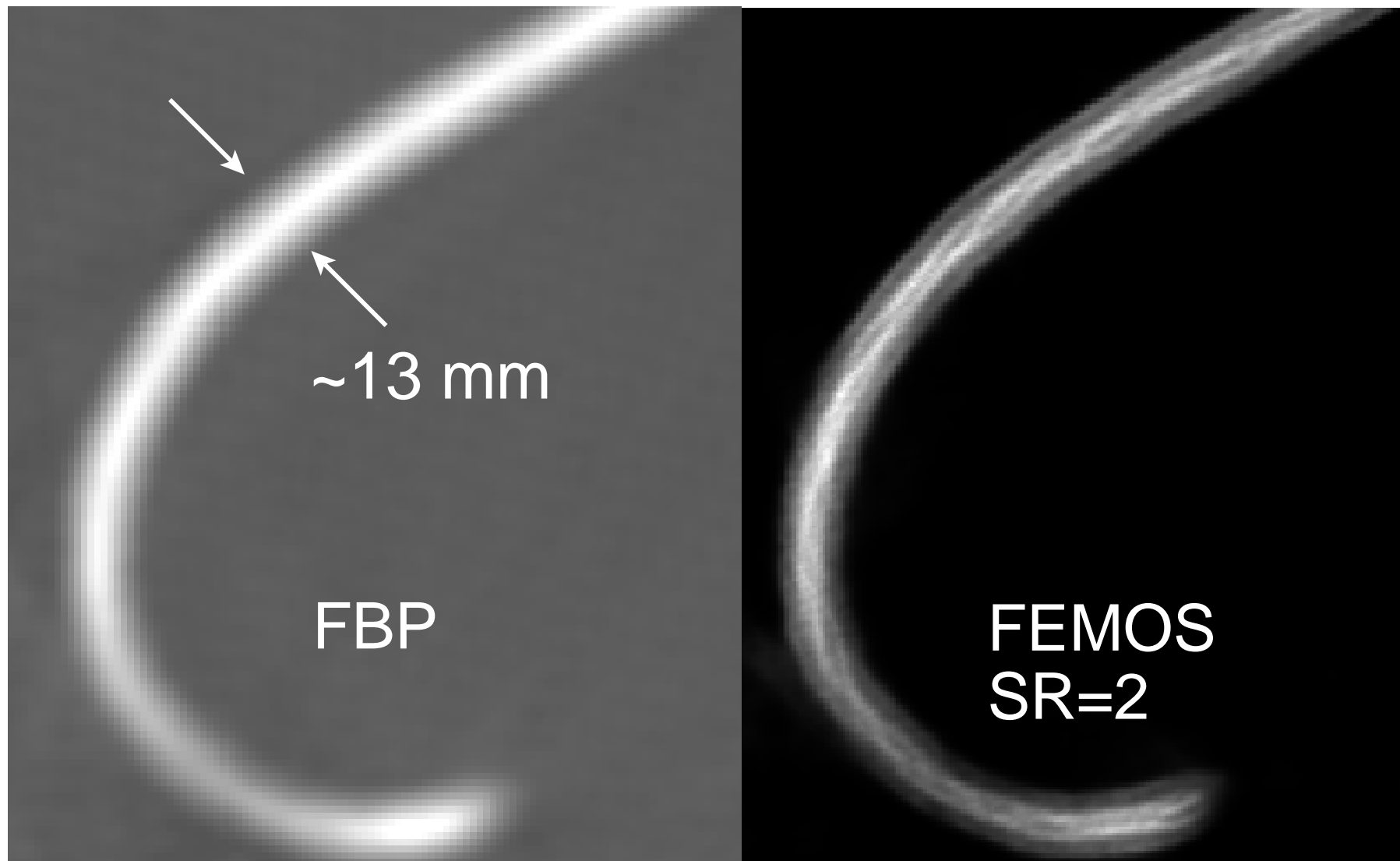


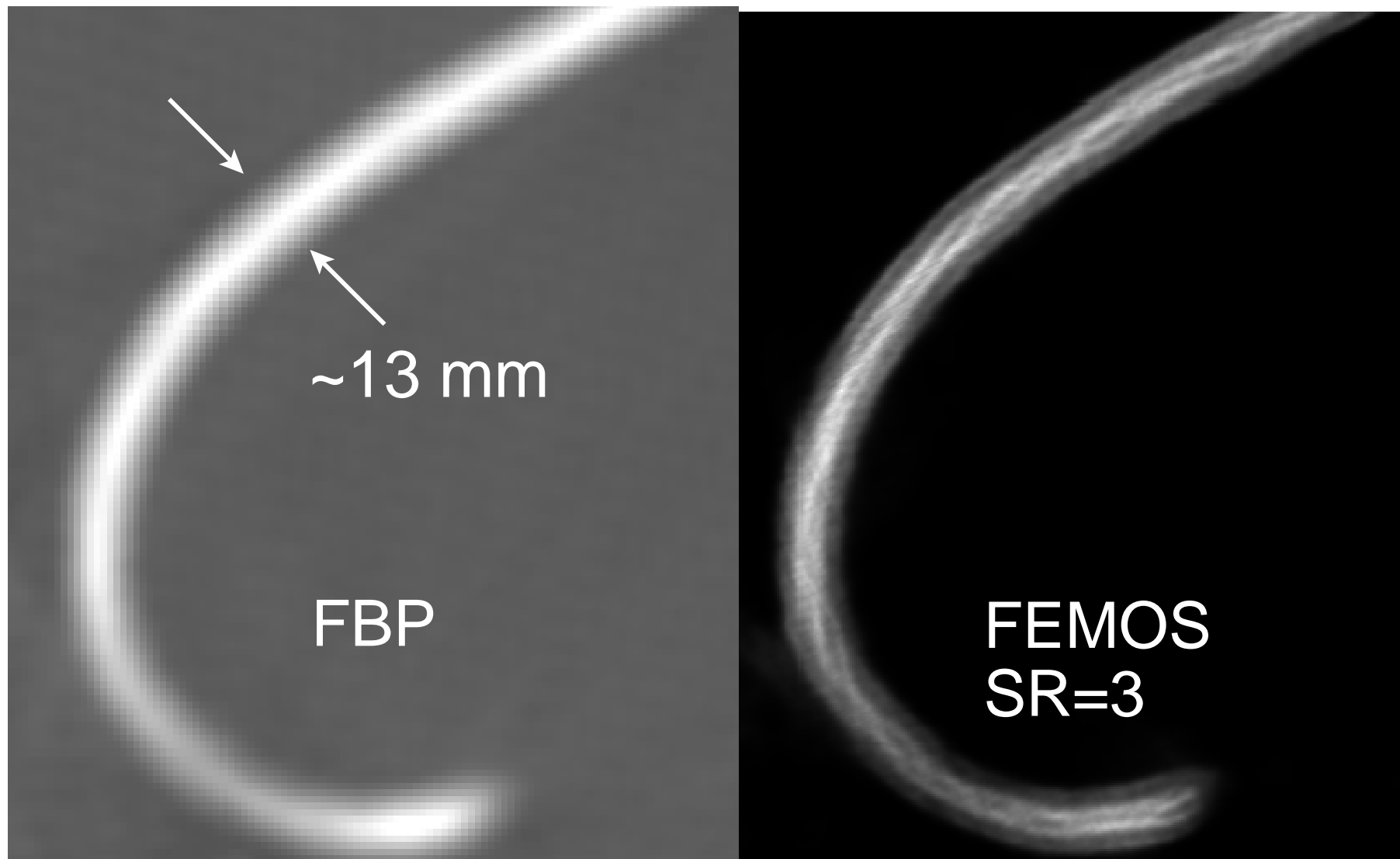


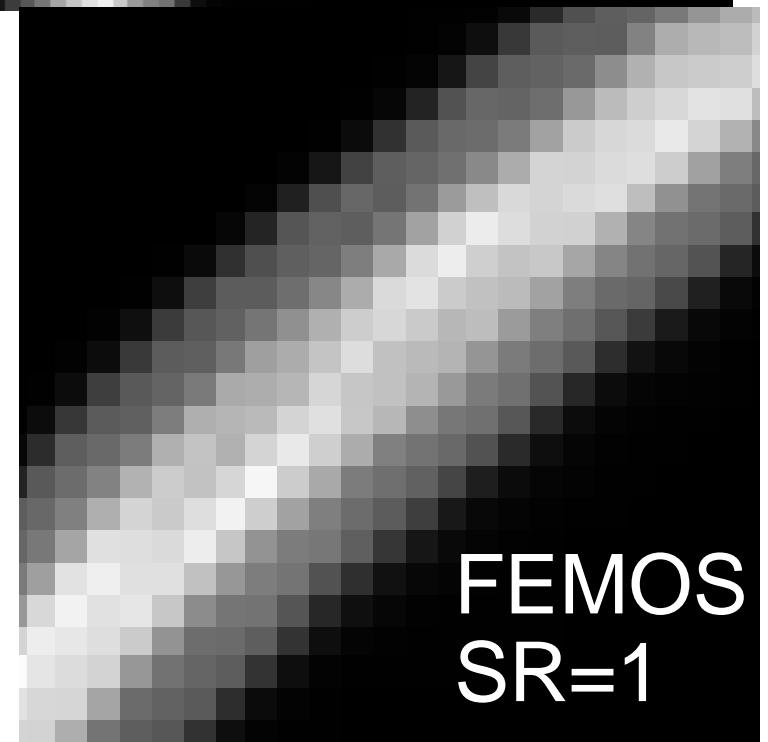
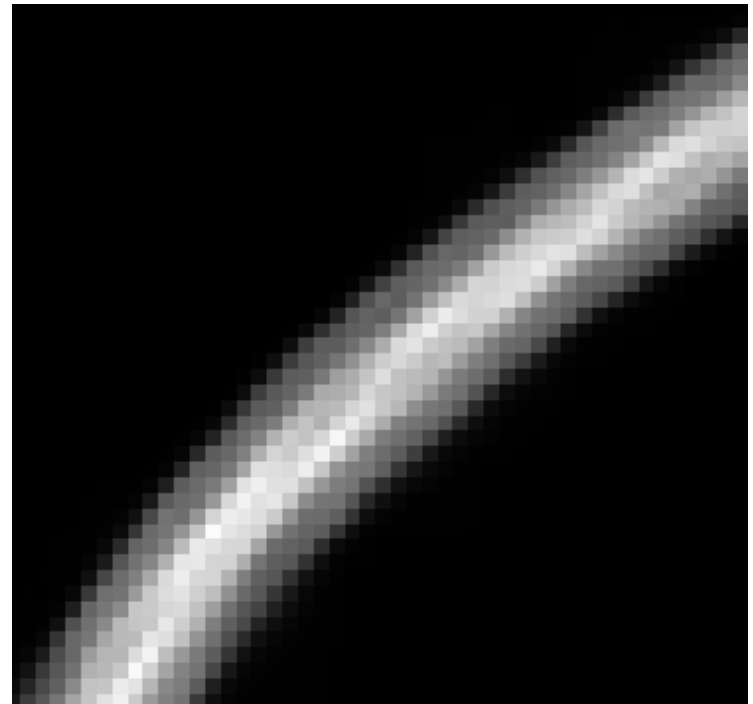
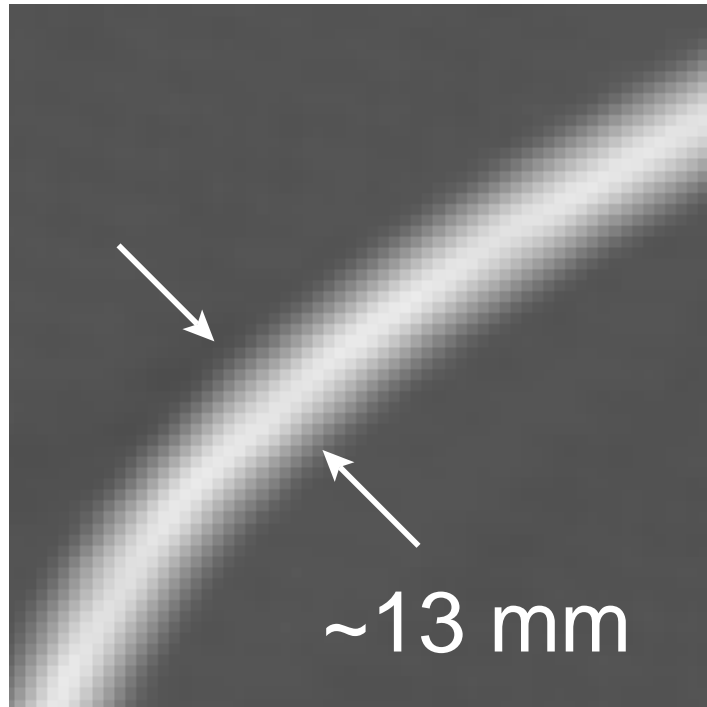
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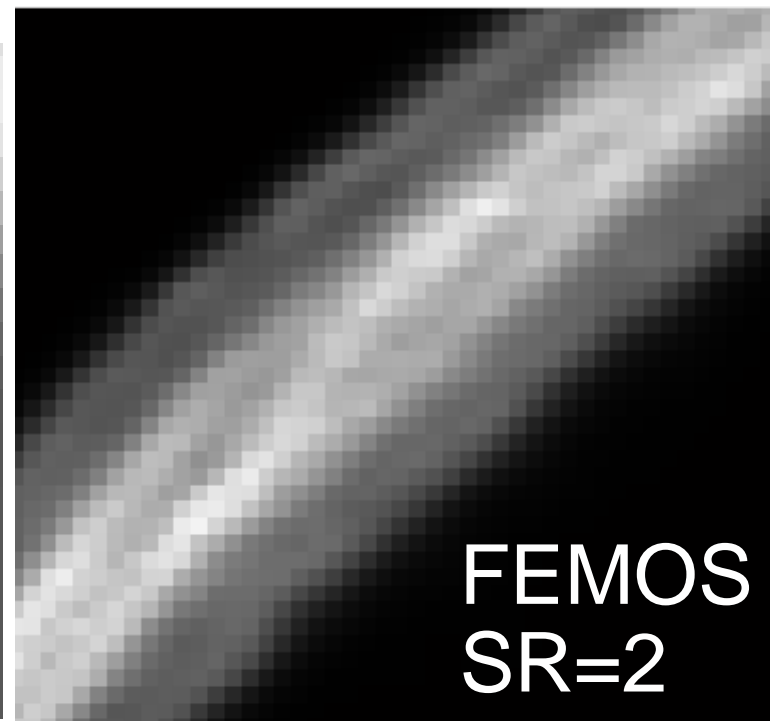
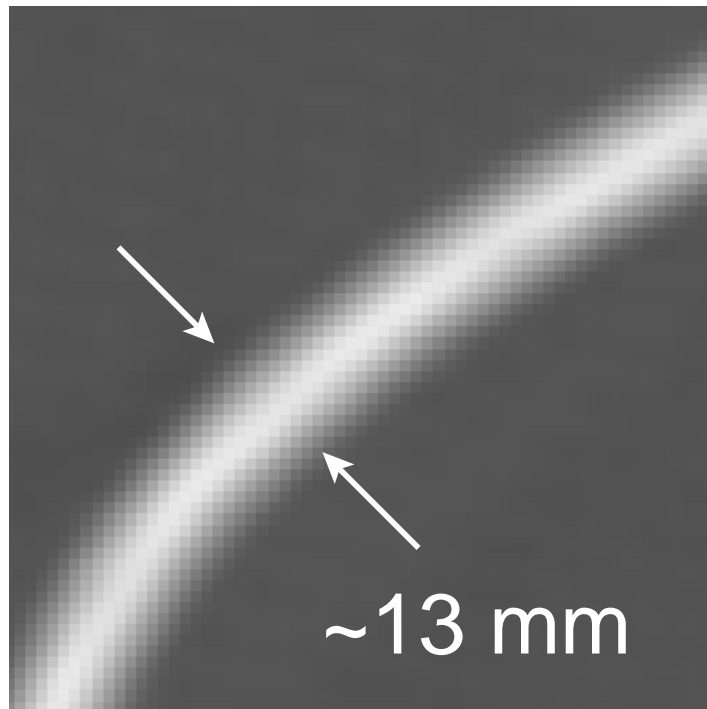


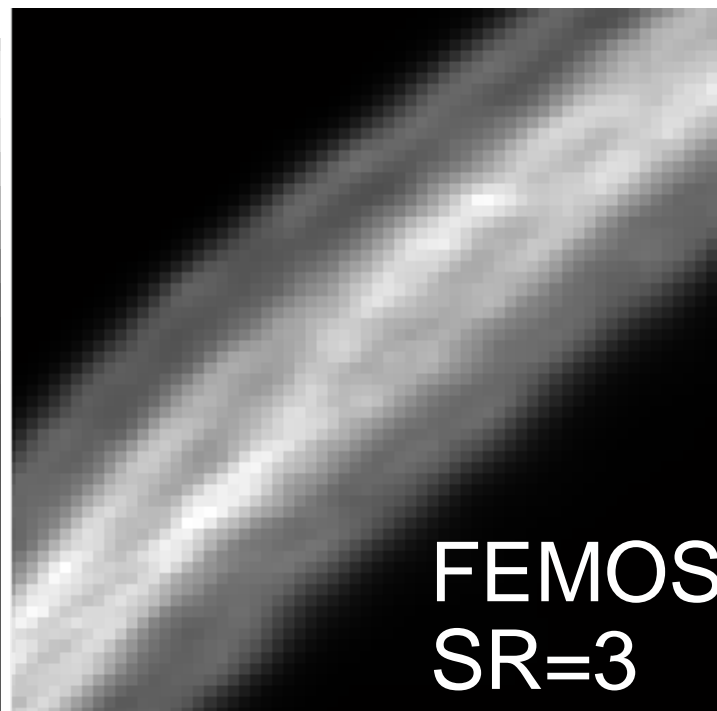
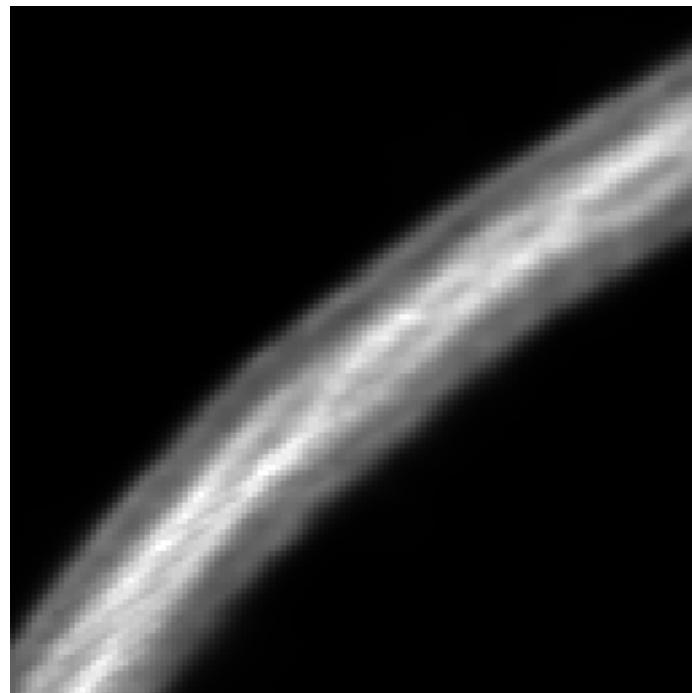
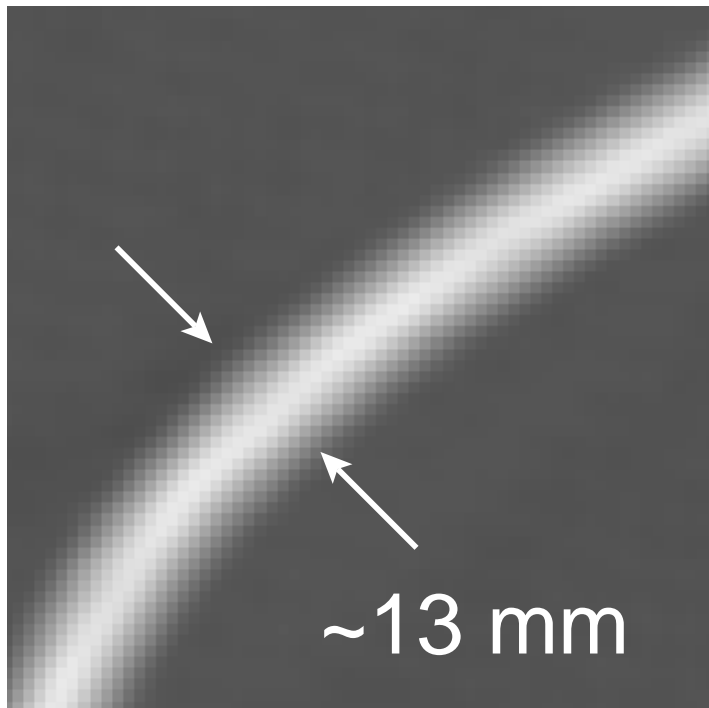


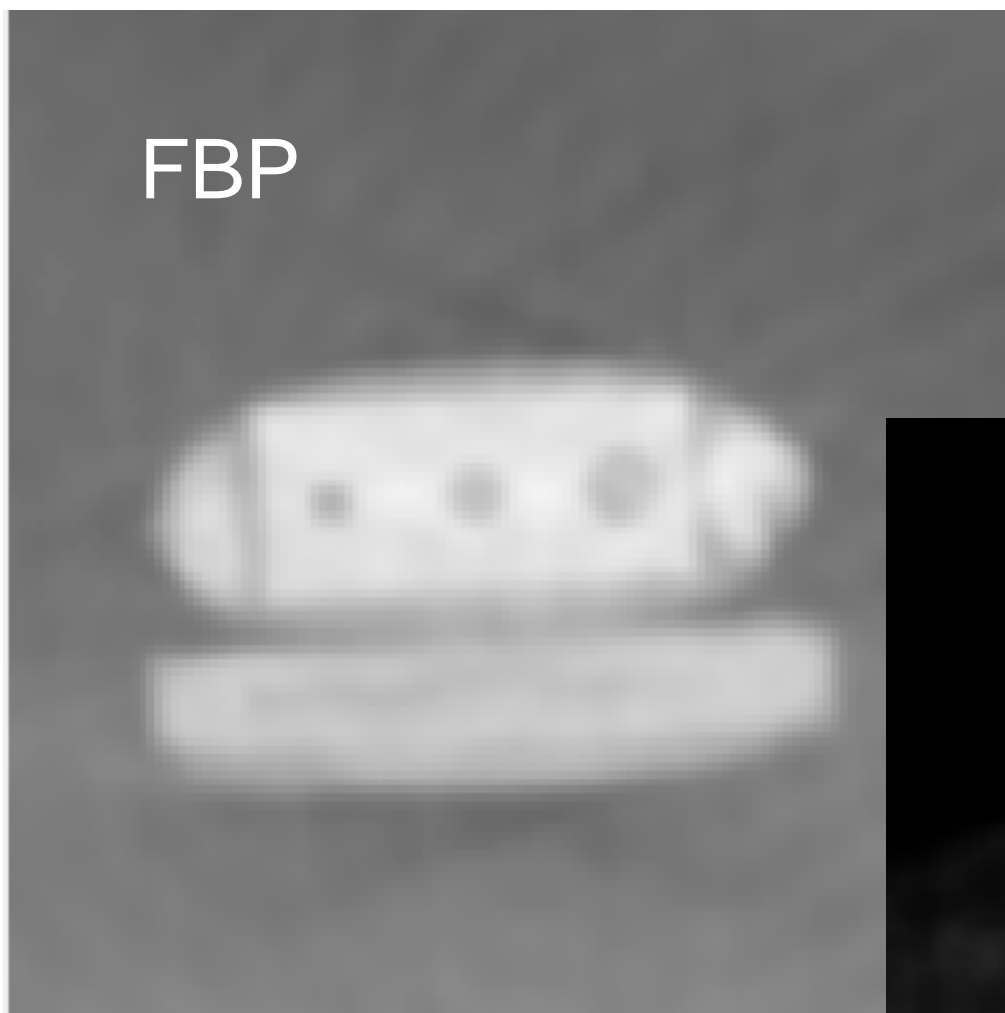




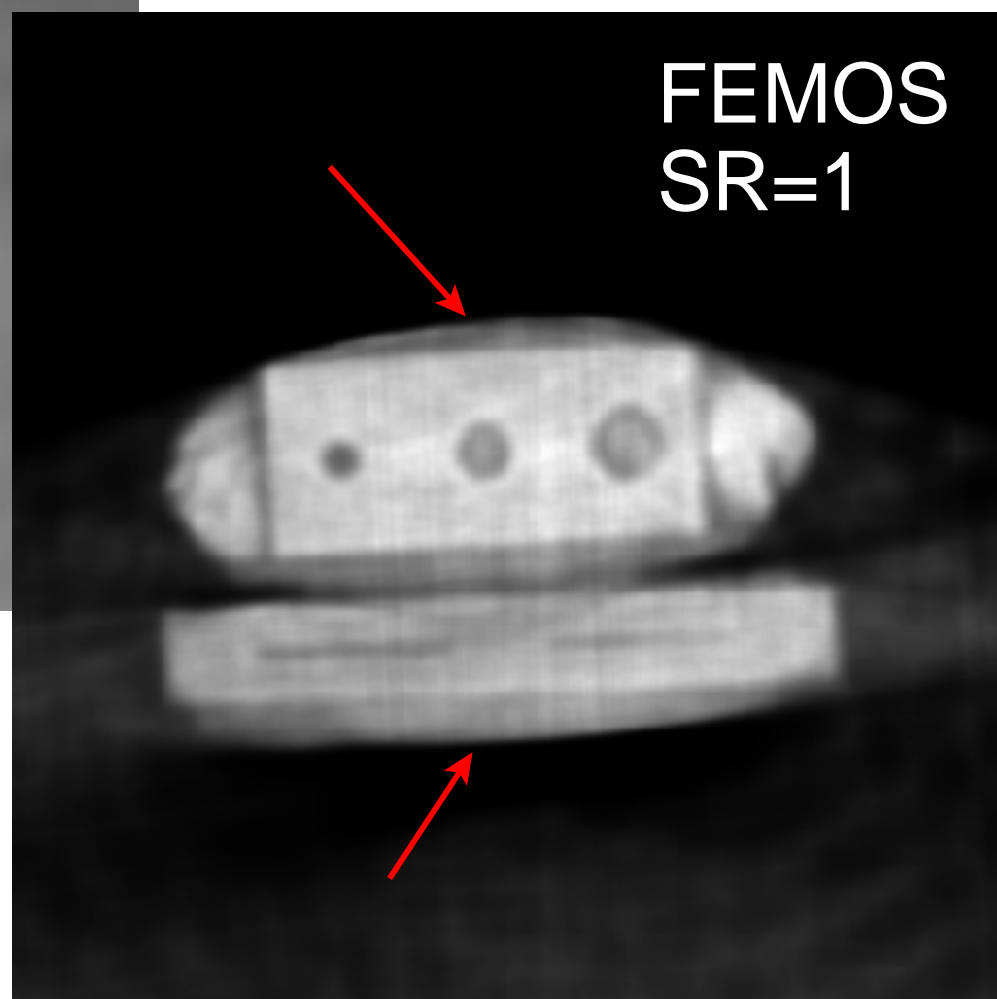


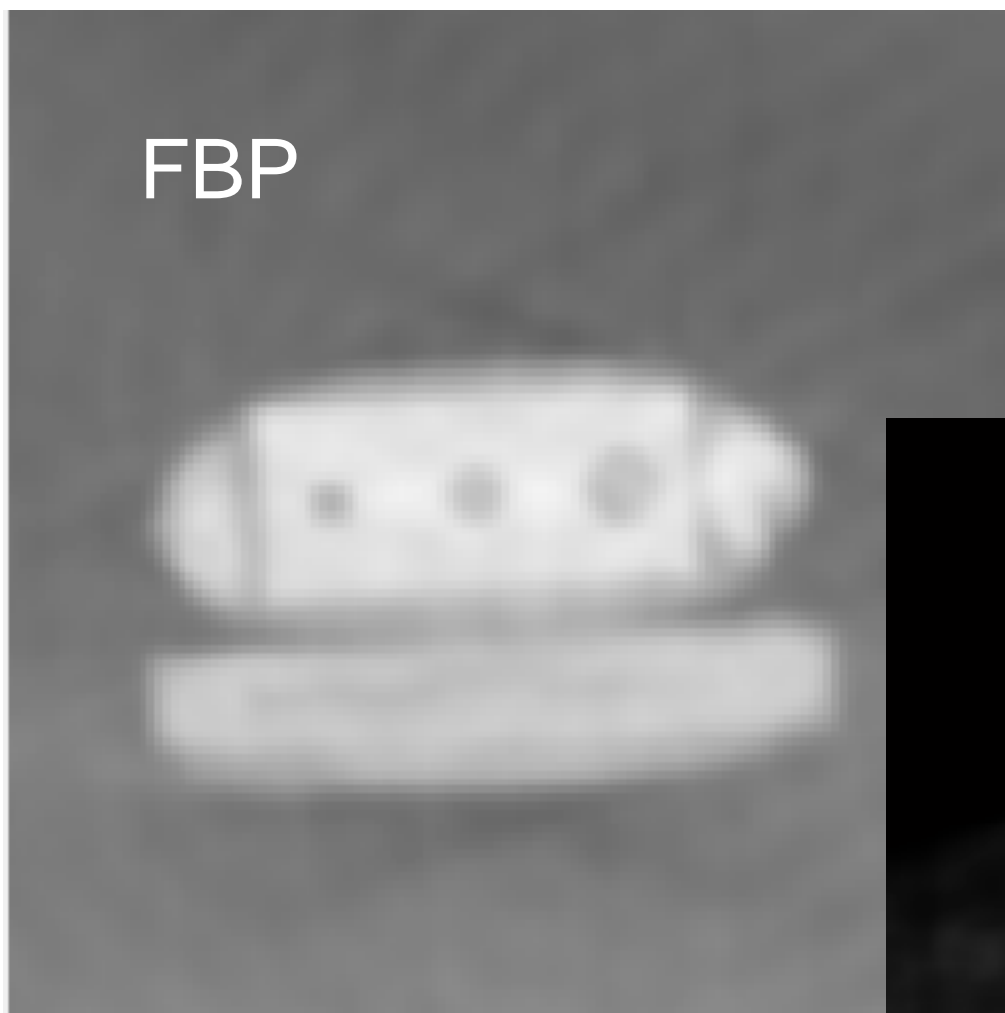




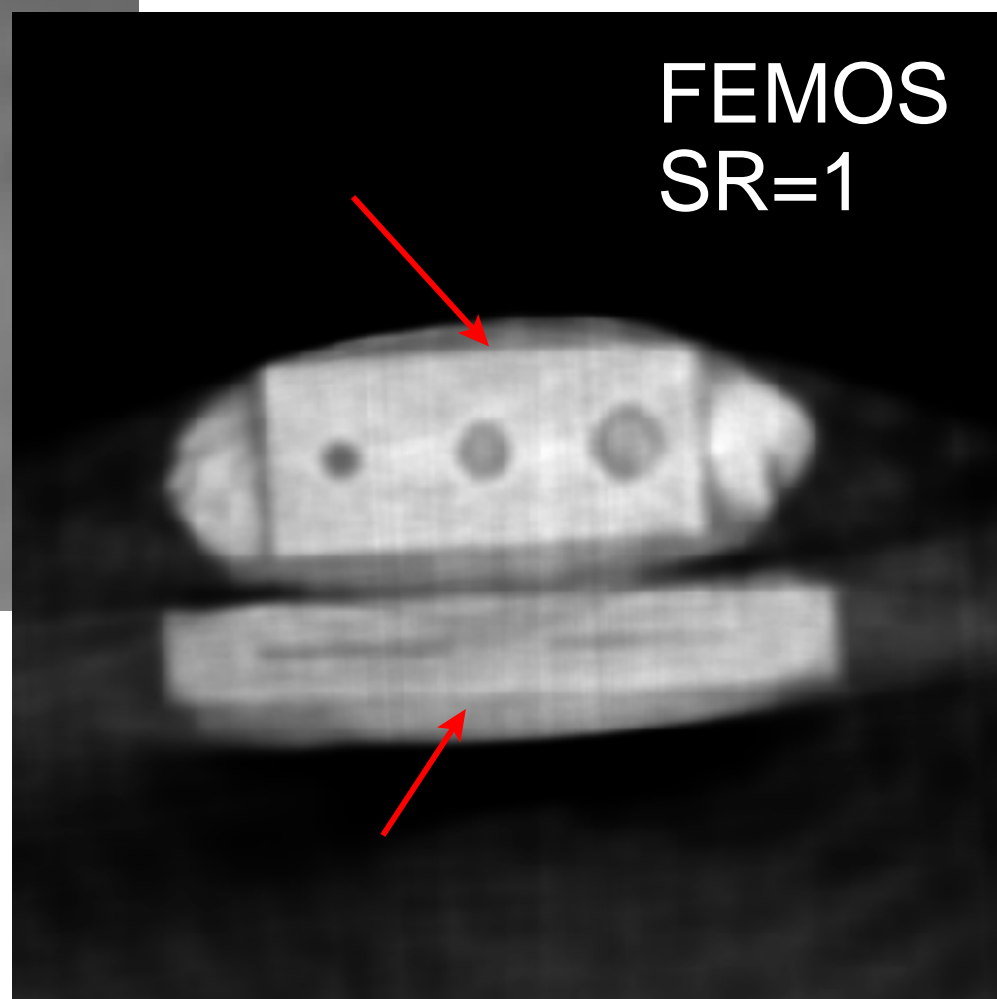


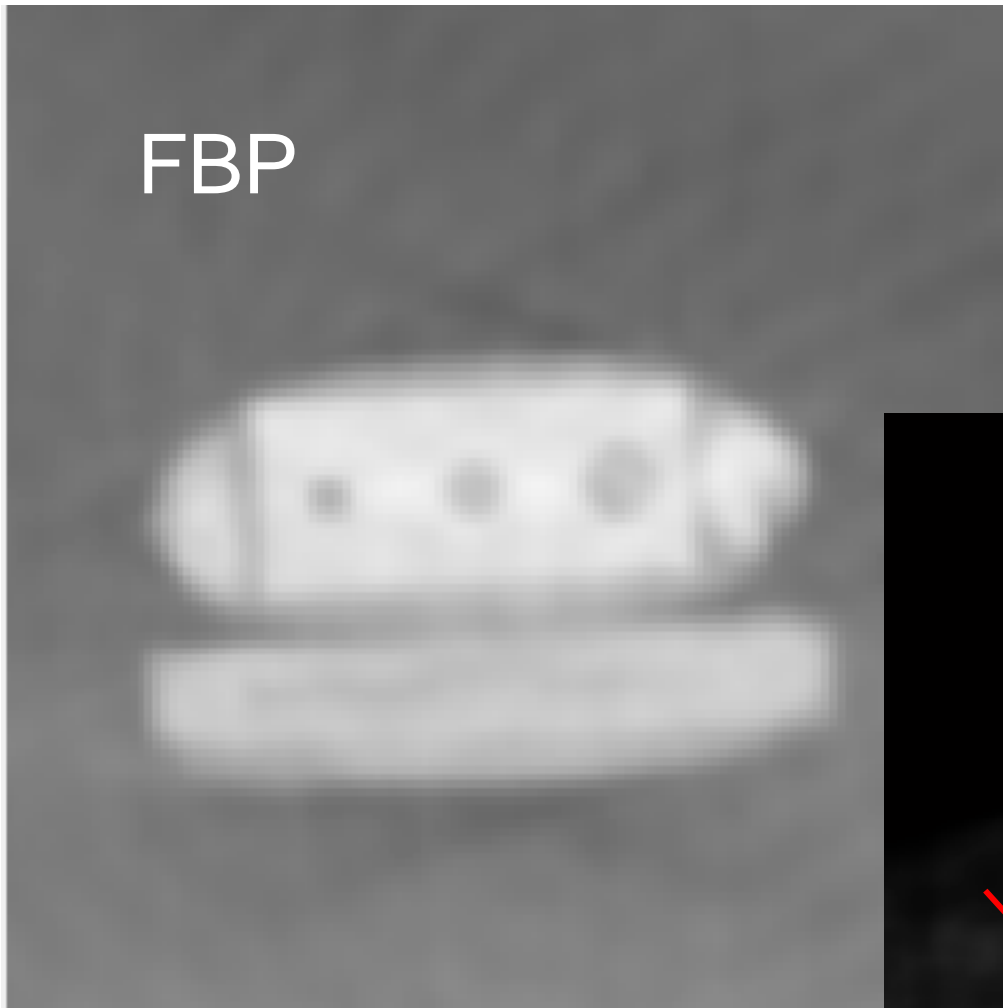
90 mm

A blue double-headed arrow indicating a width of 90 mm, positioned below the FBP image.

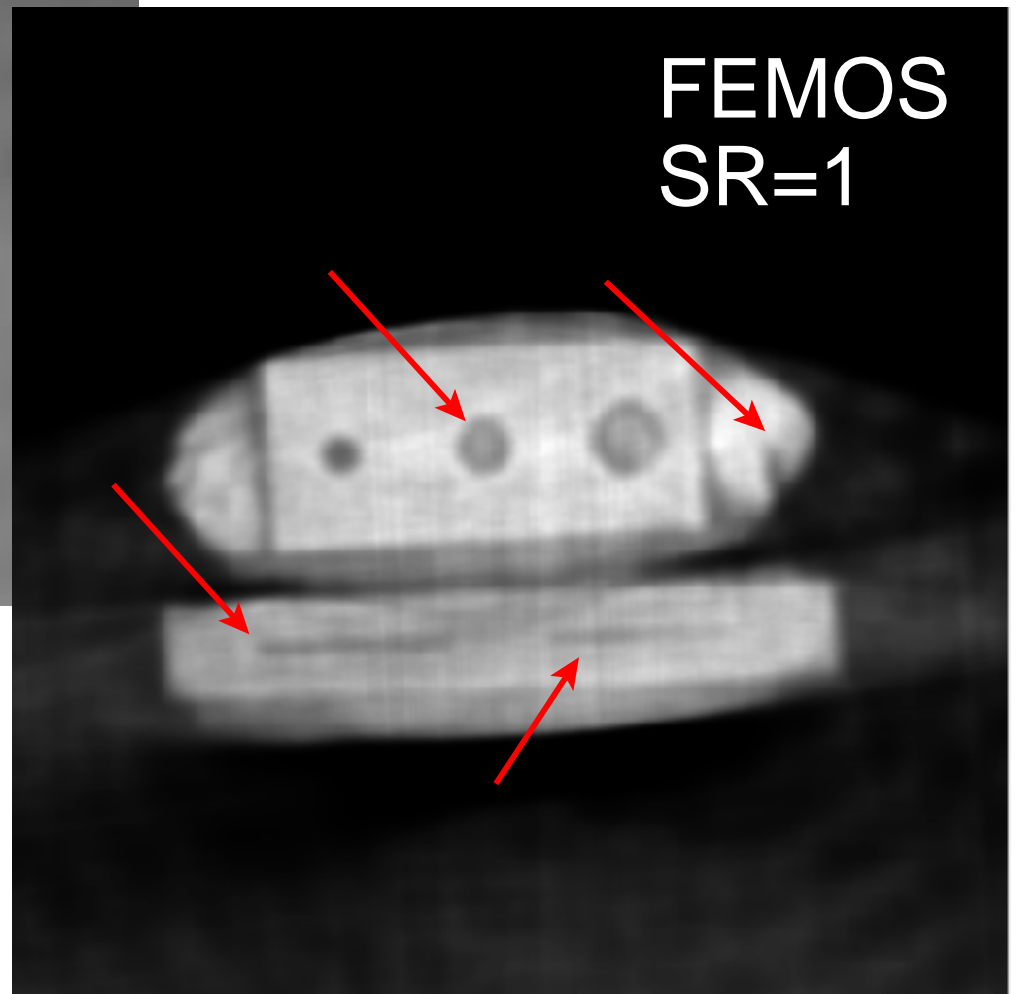


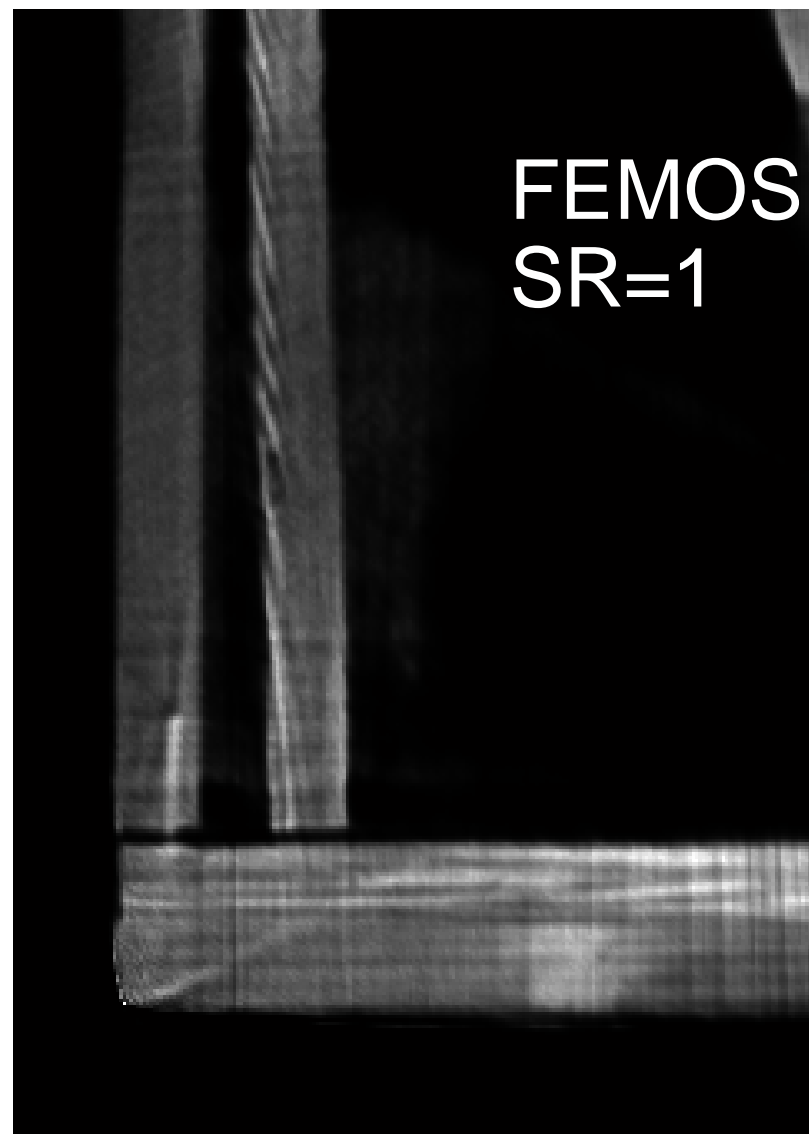
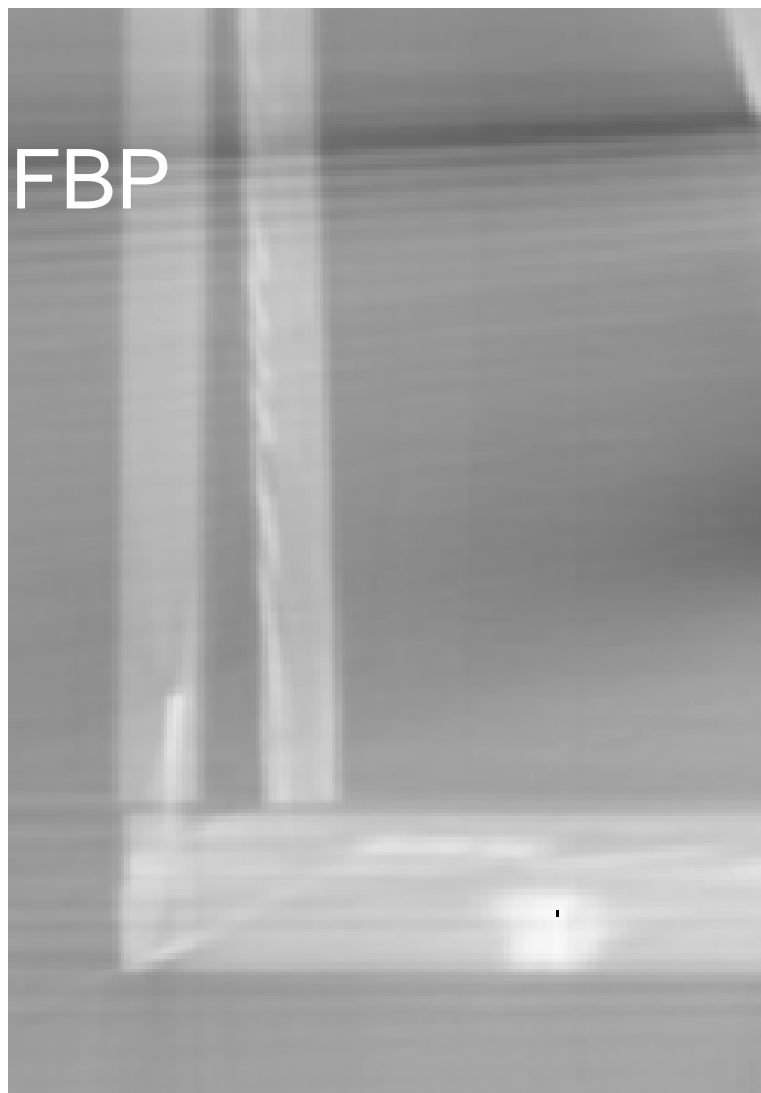
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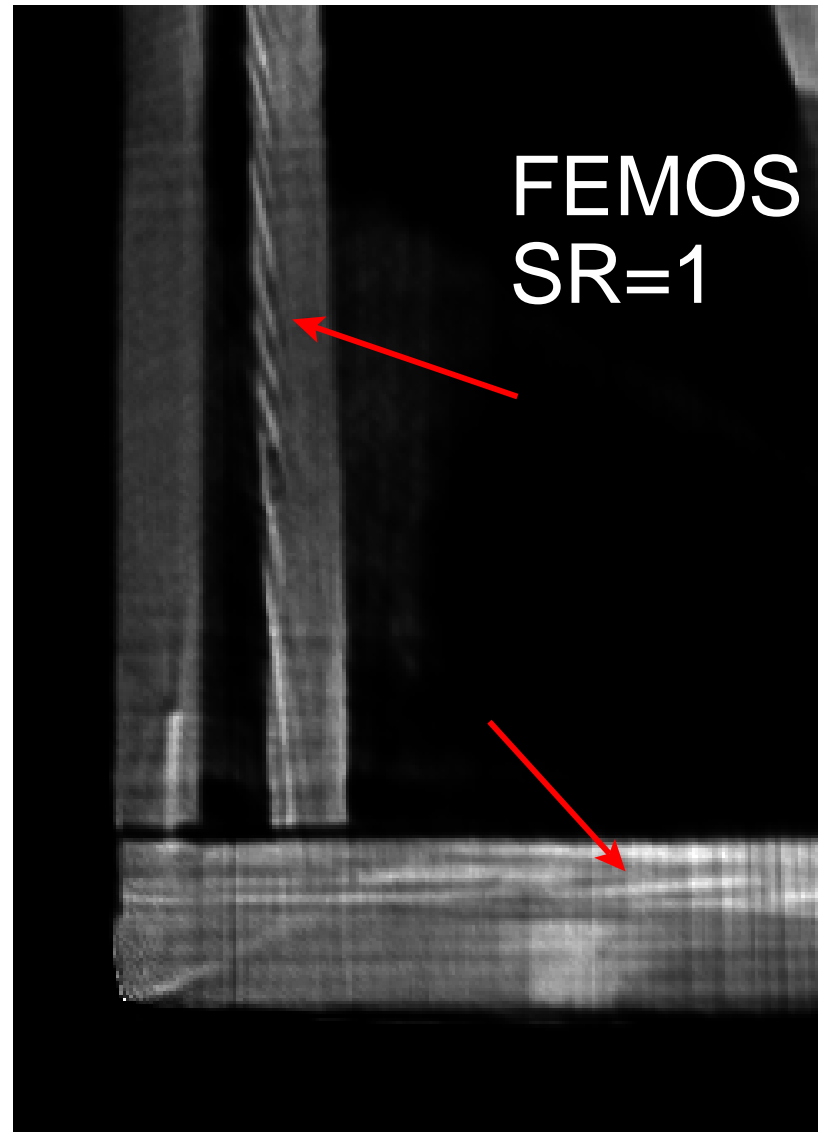
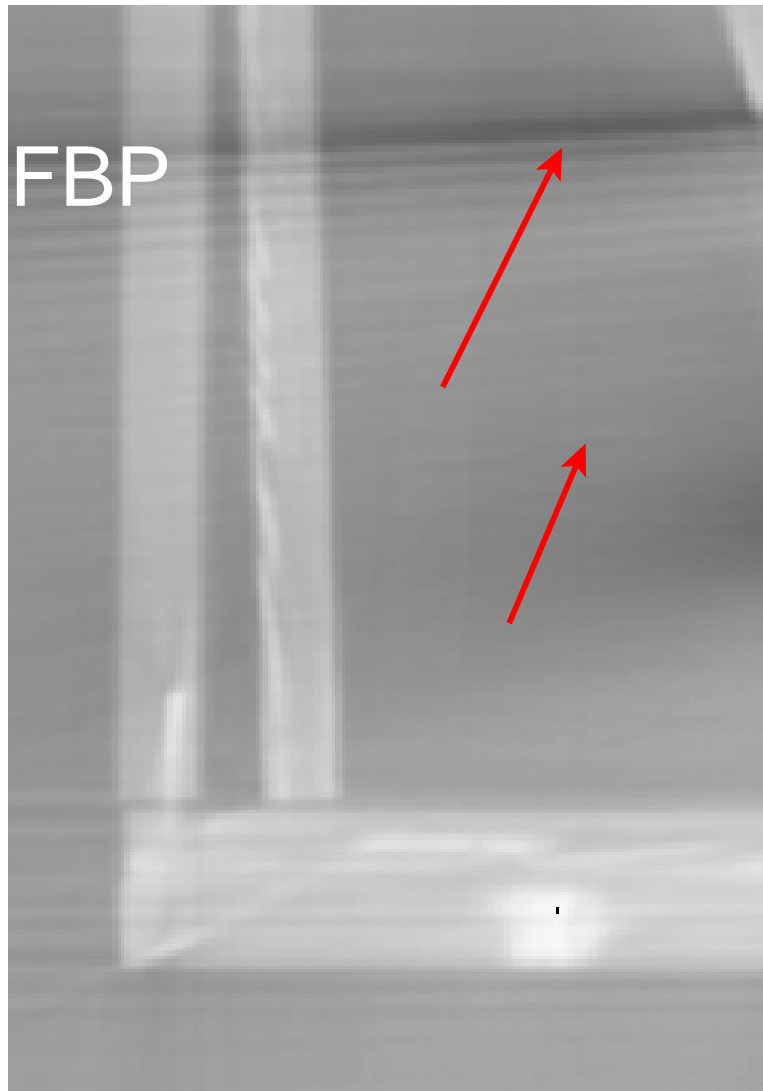
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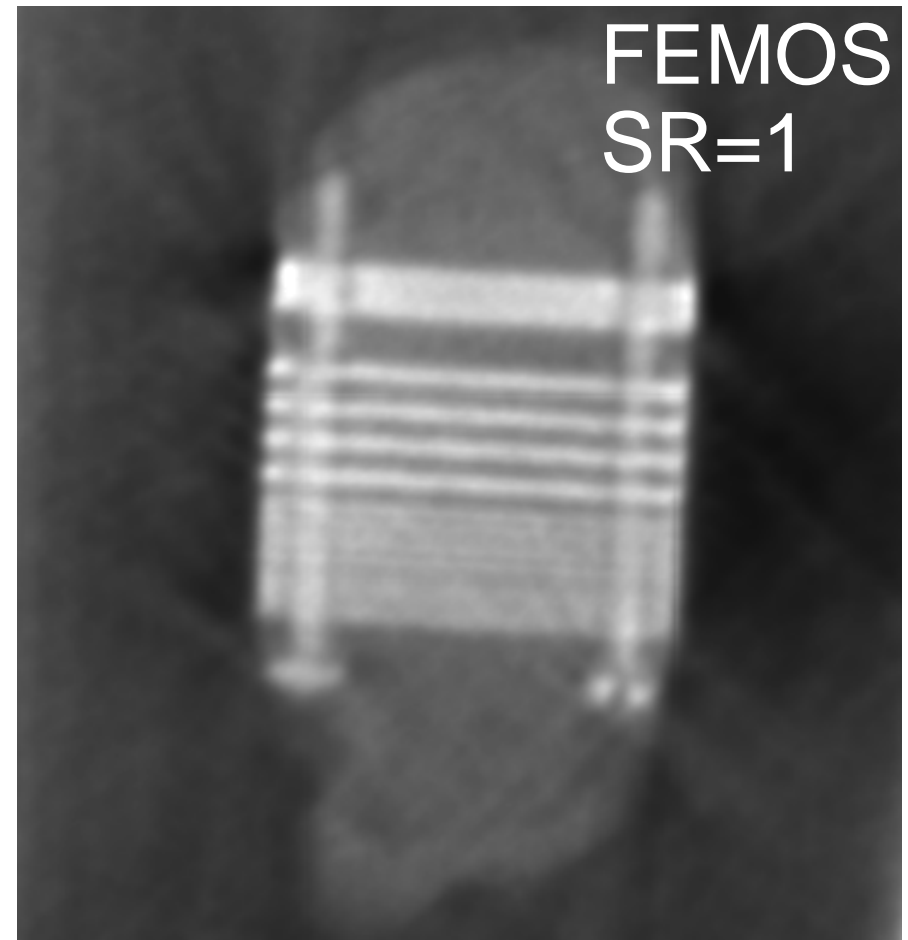
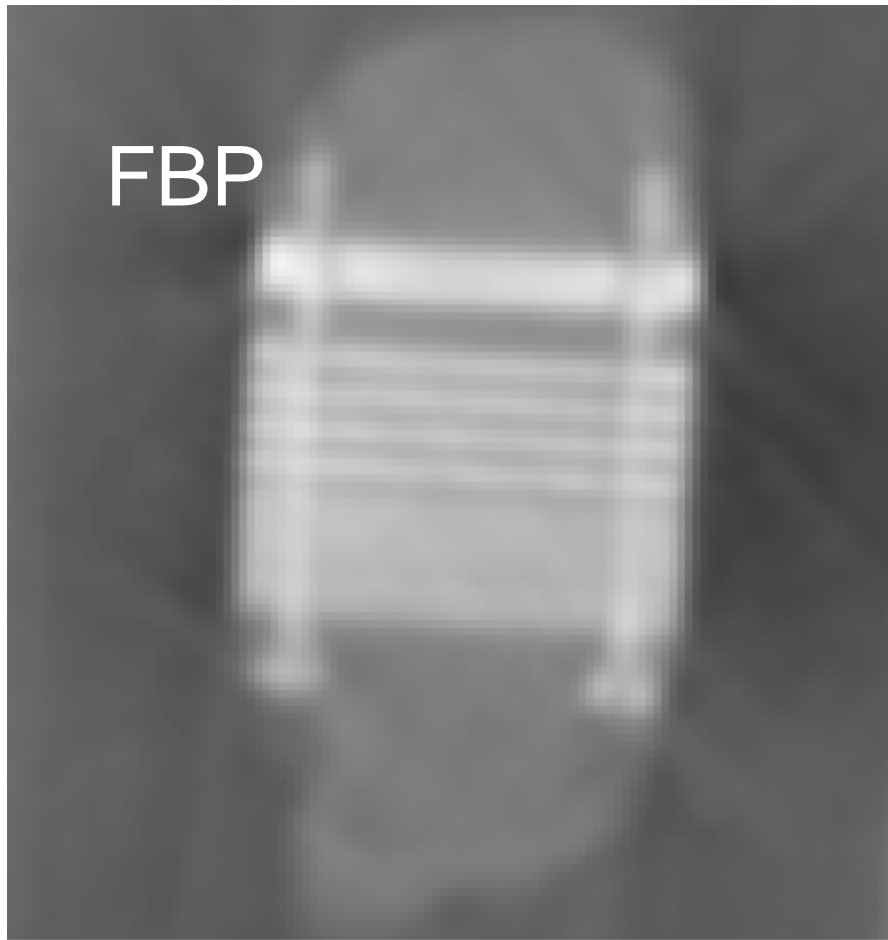


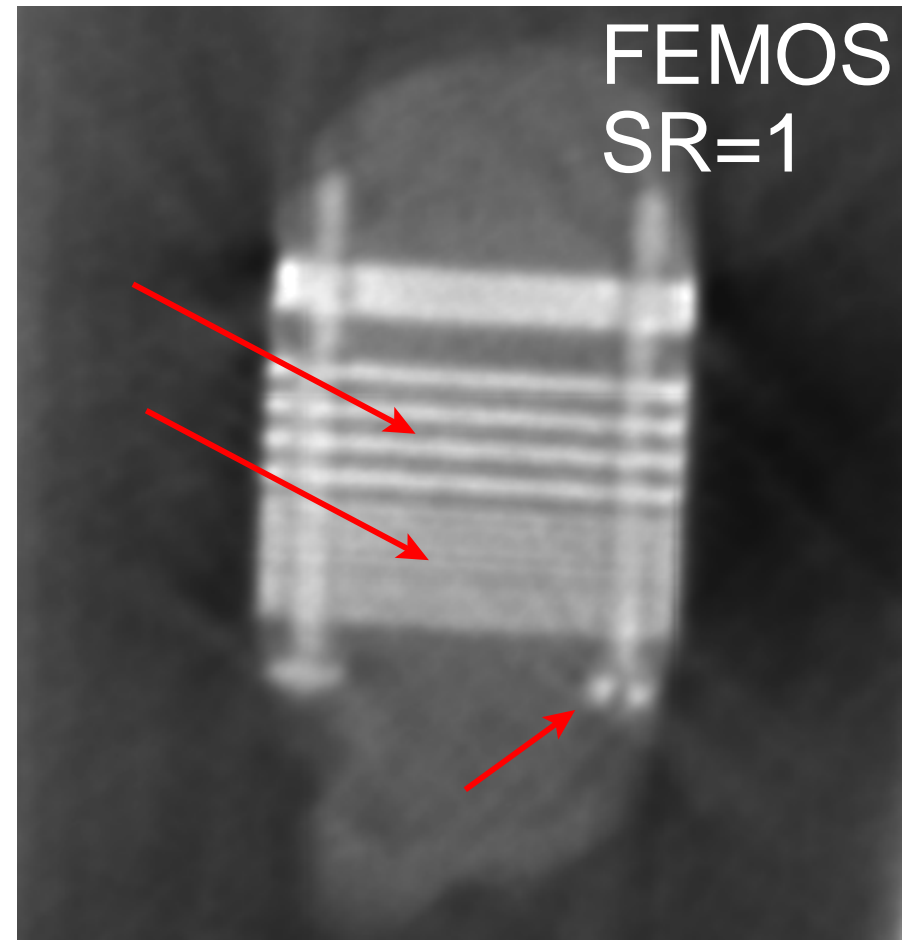
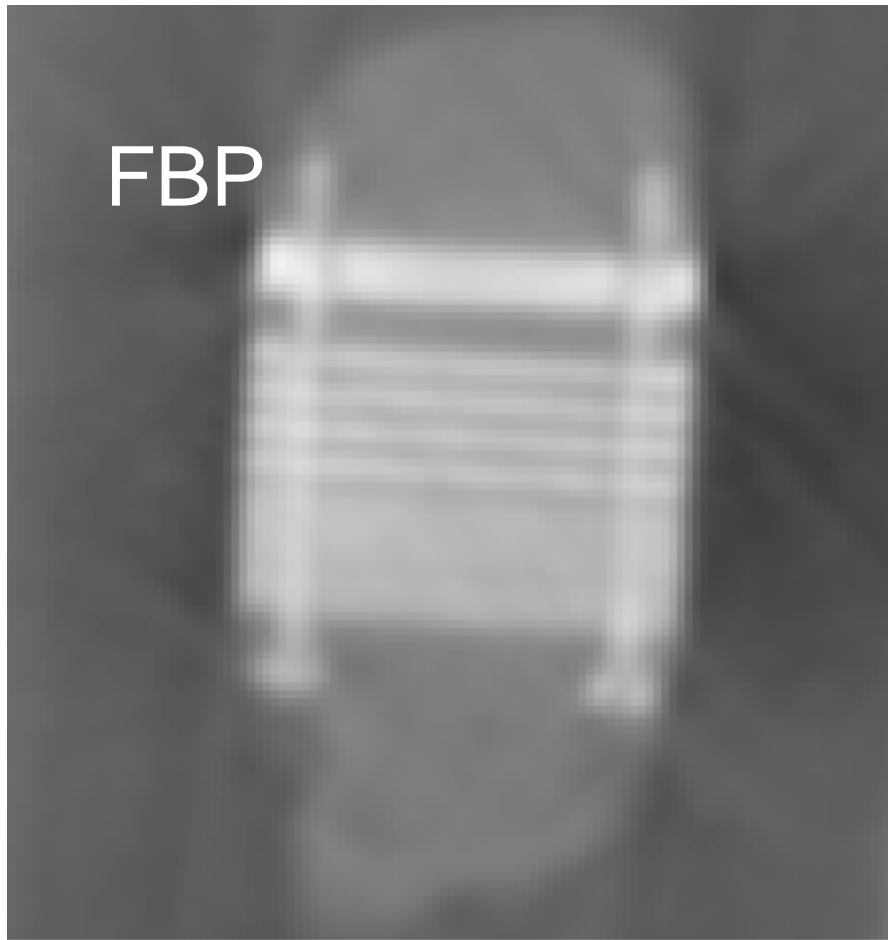
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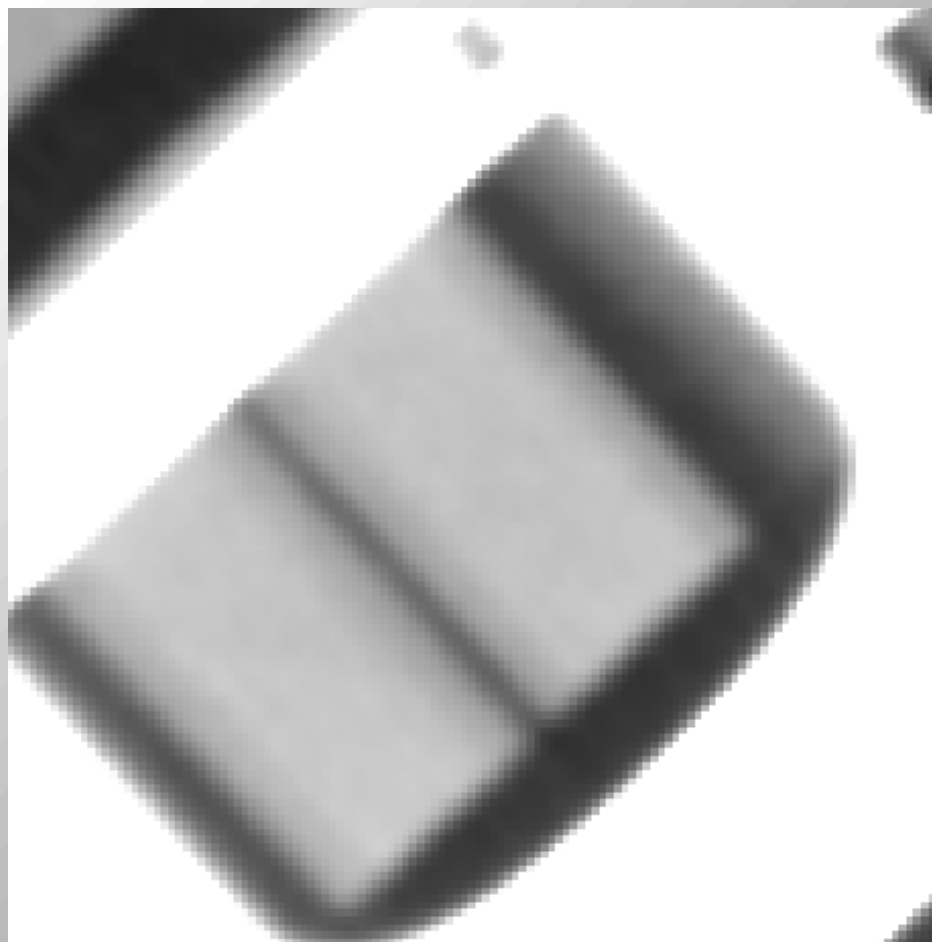
A blue double-headed arrow indicating a scale of 90 mm.





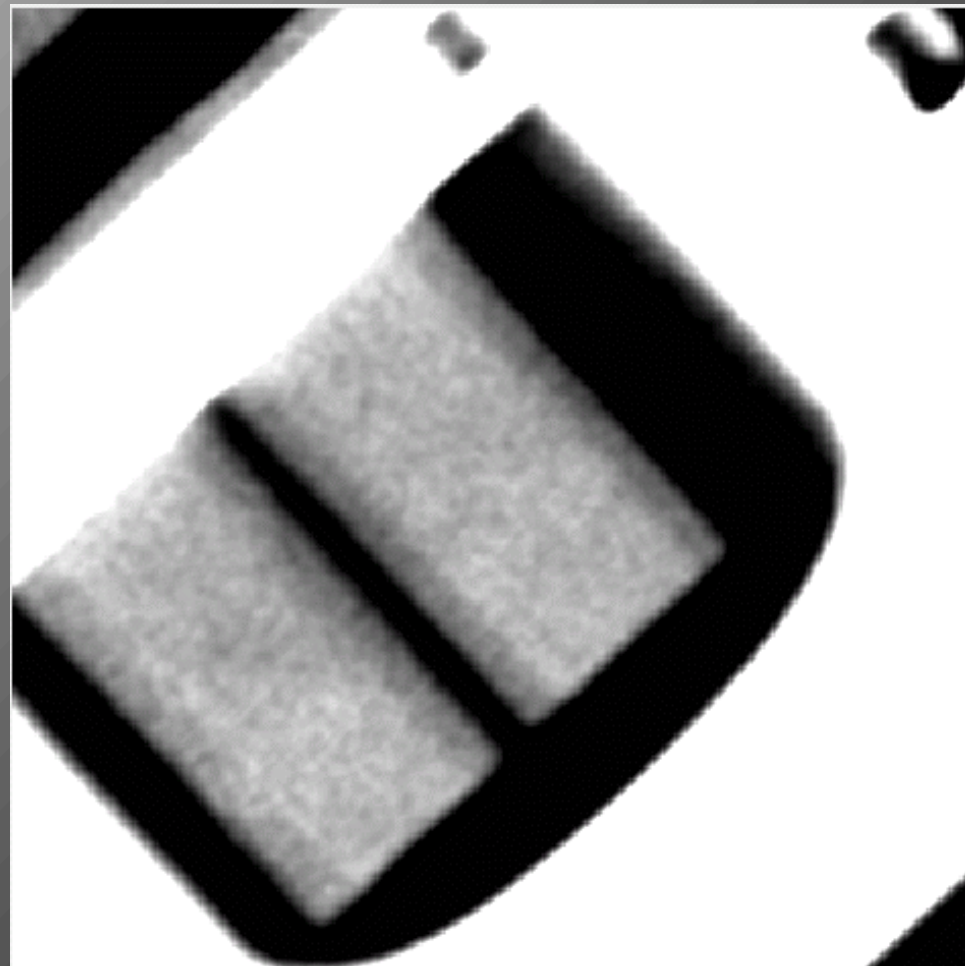


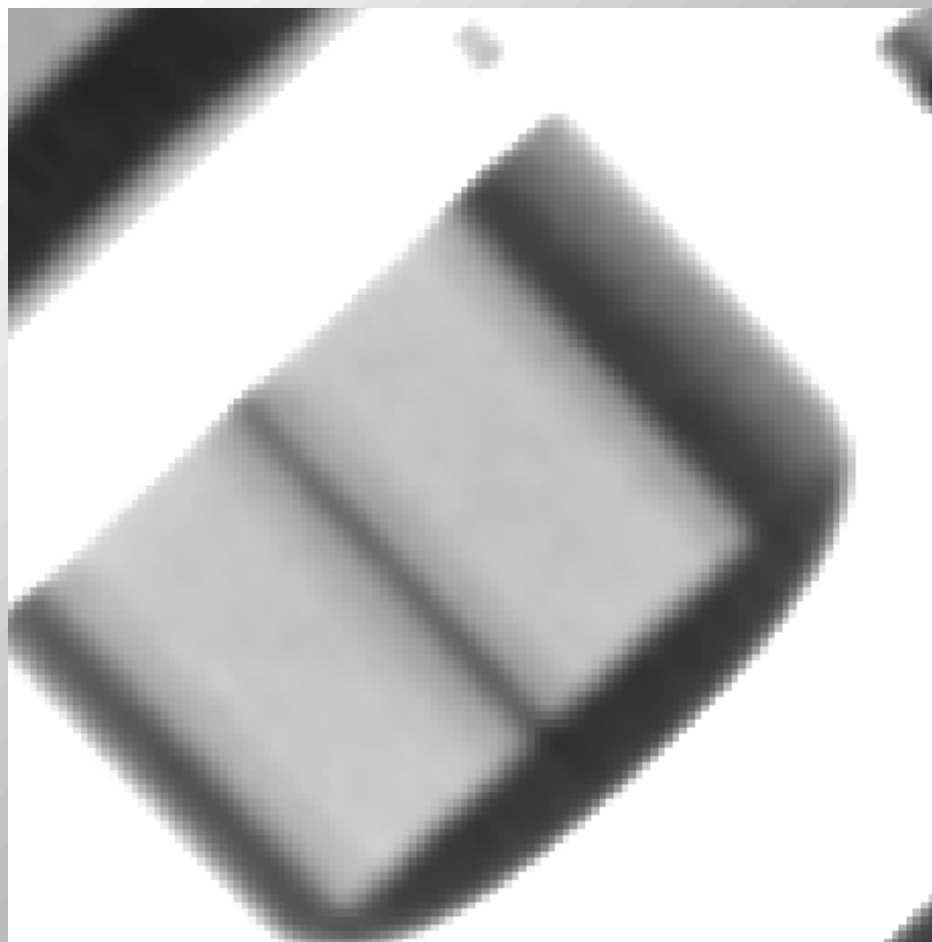




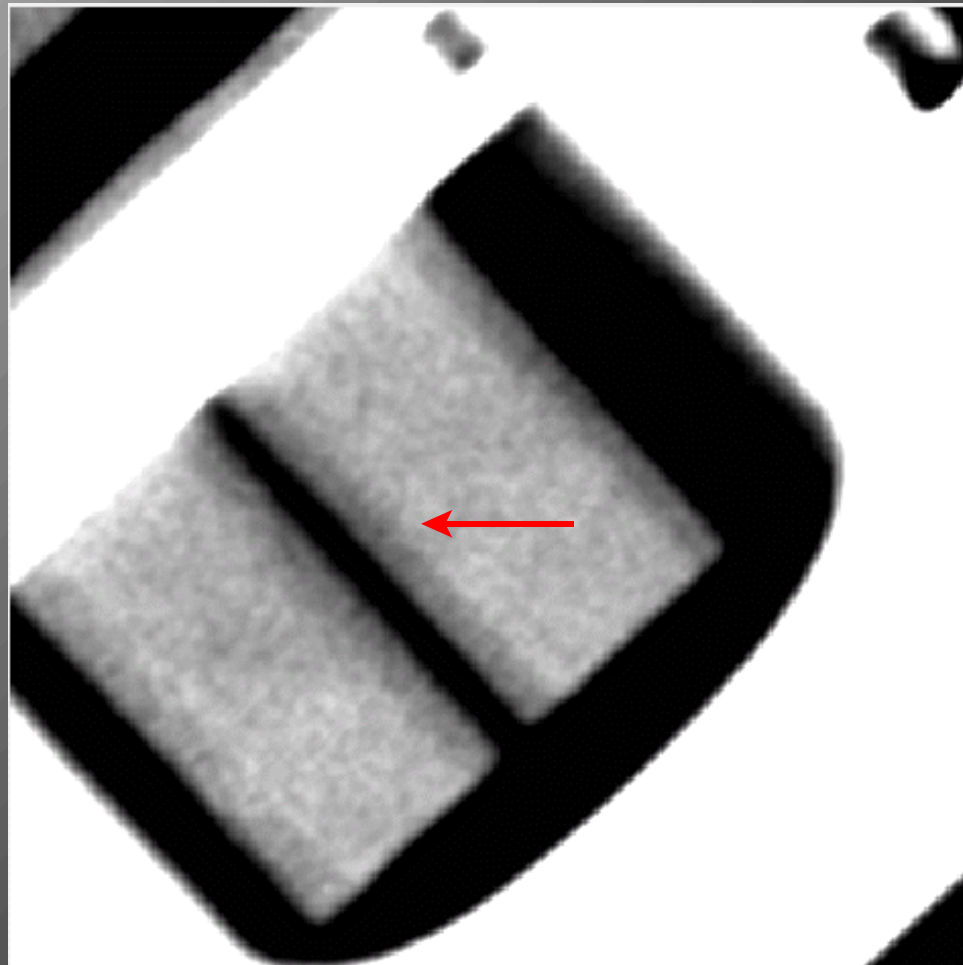
FBP

FEMOS
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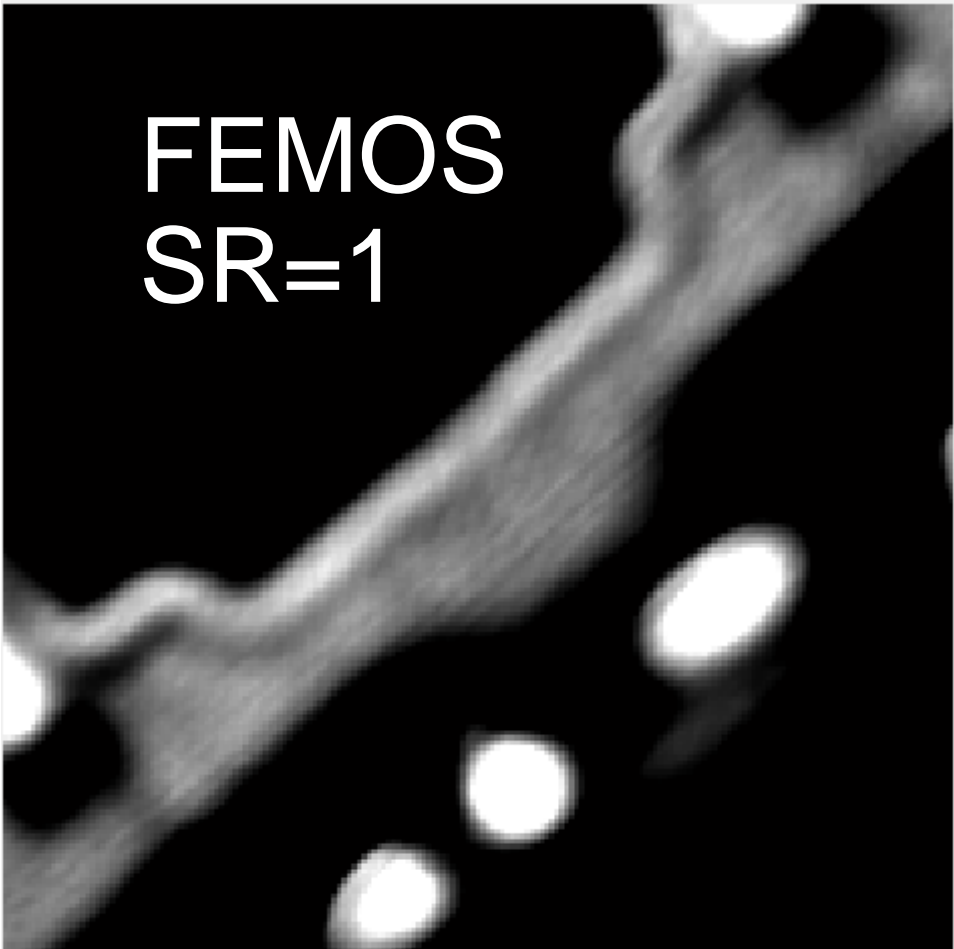
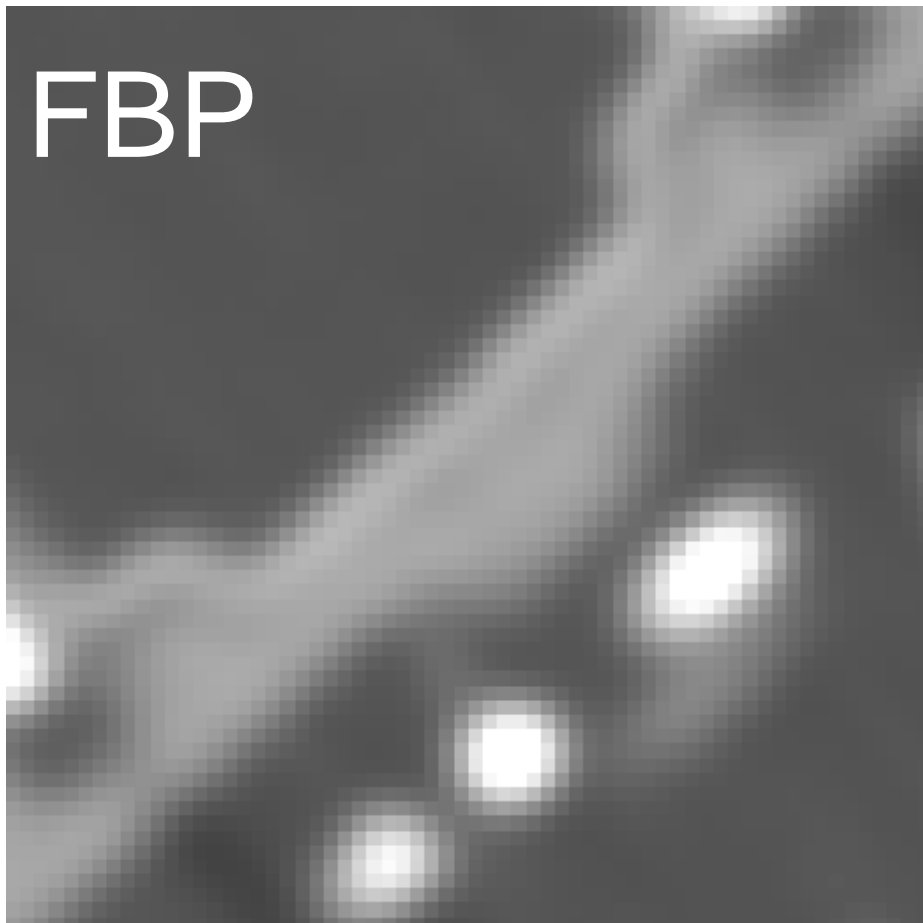


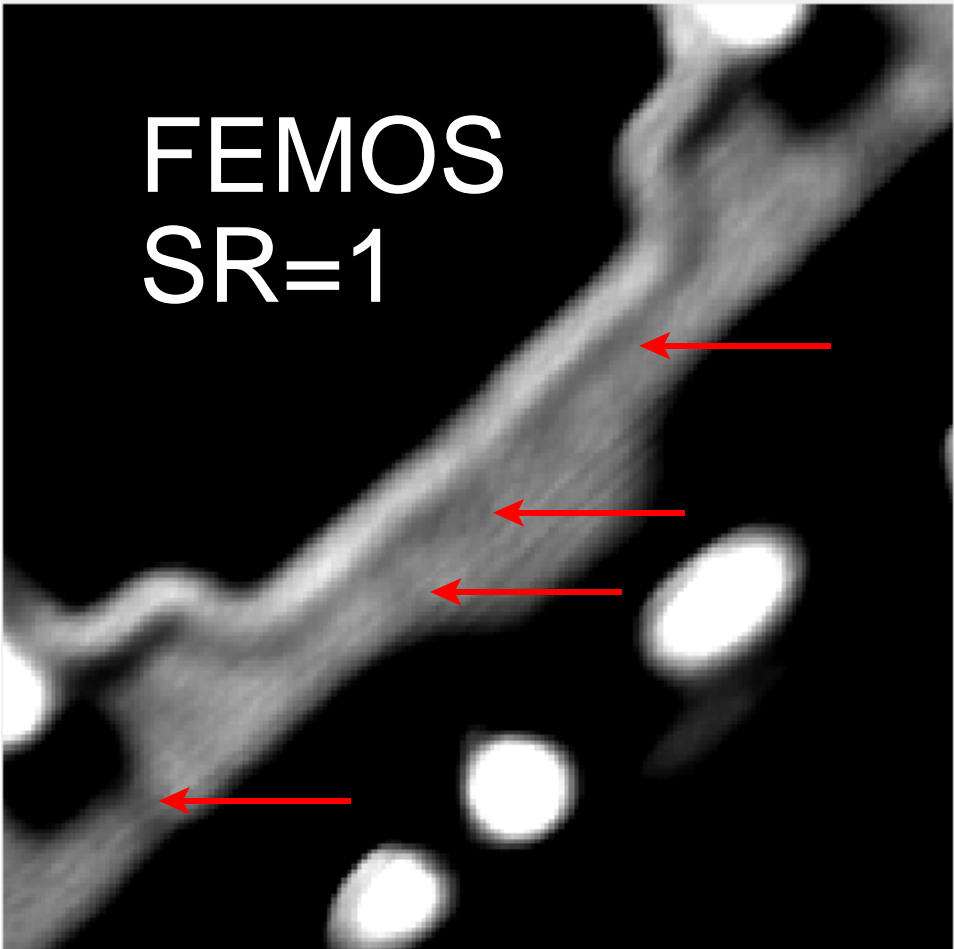
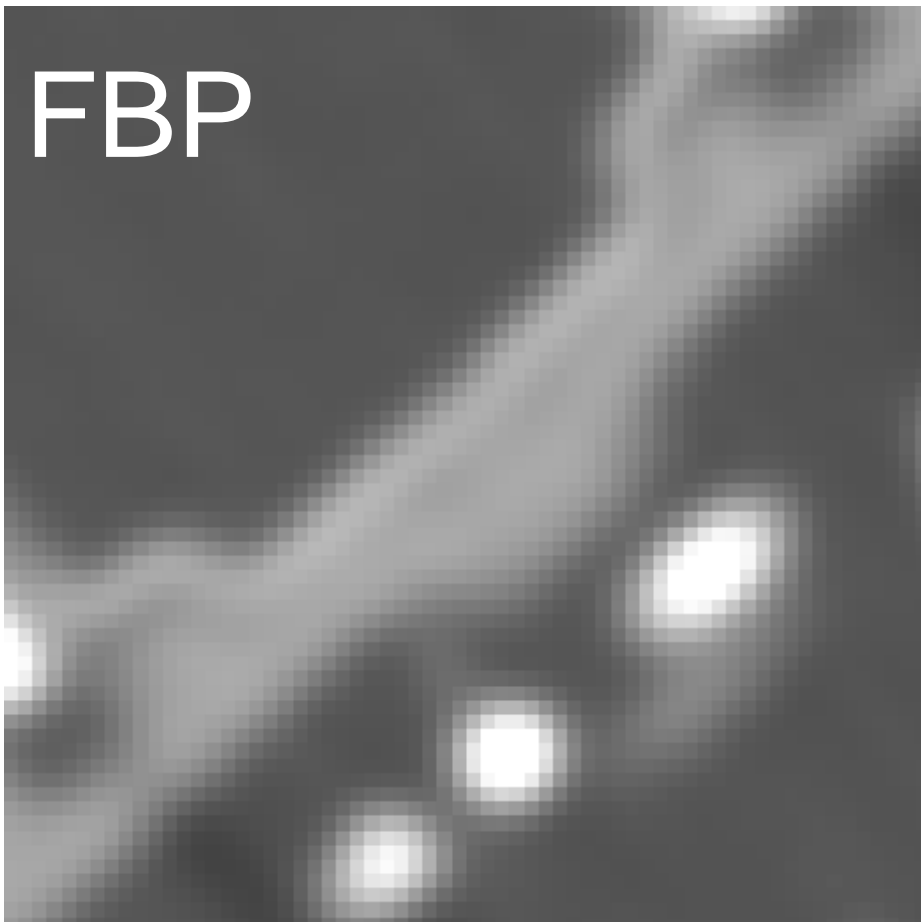


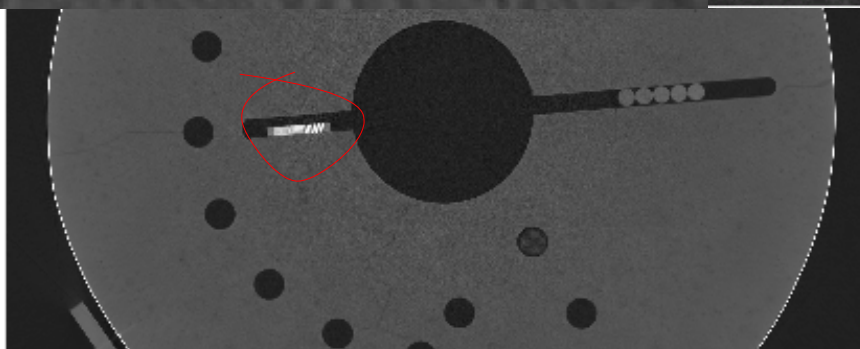
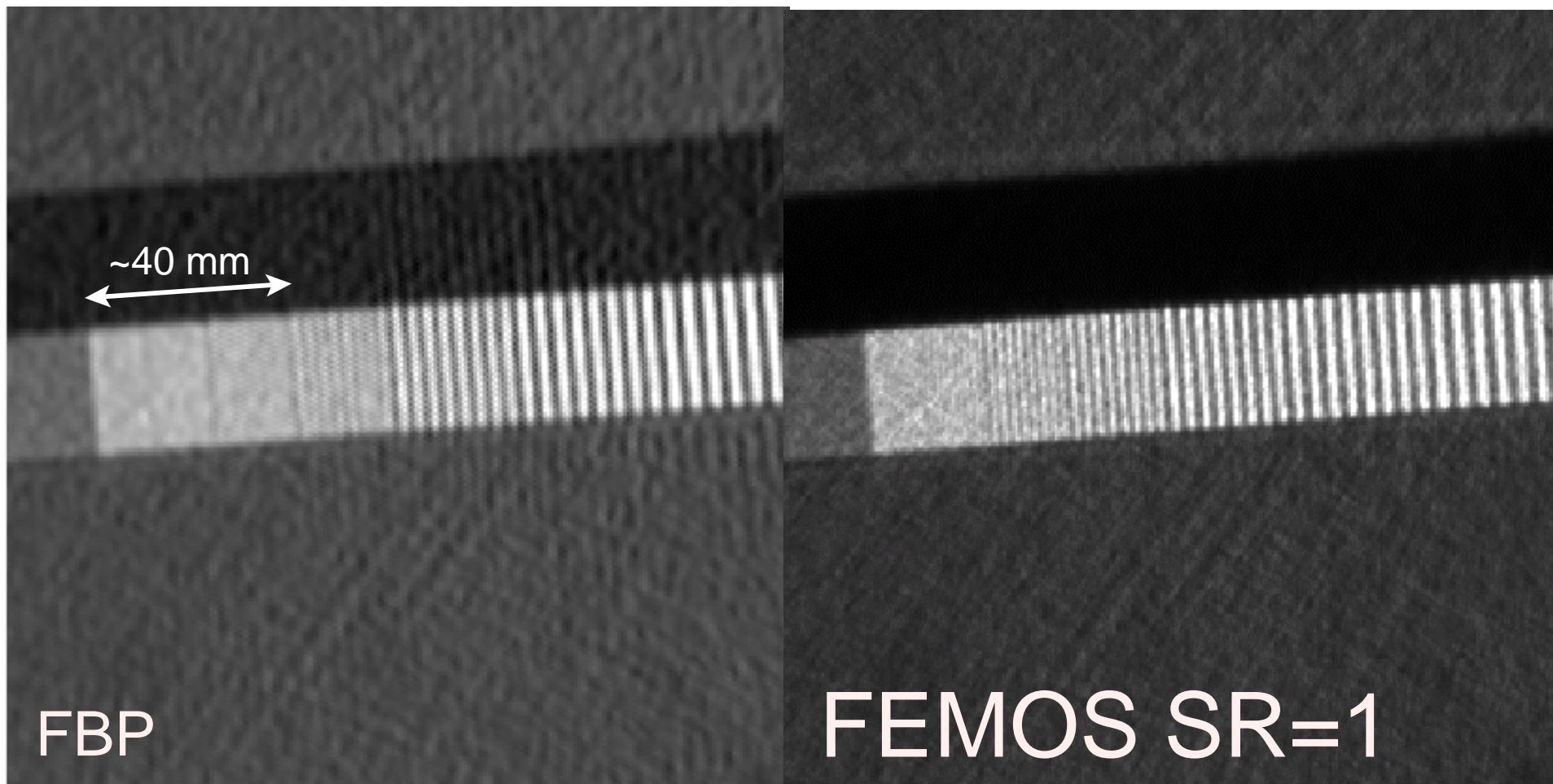
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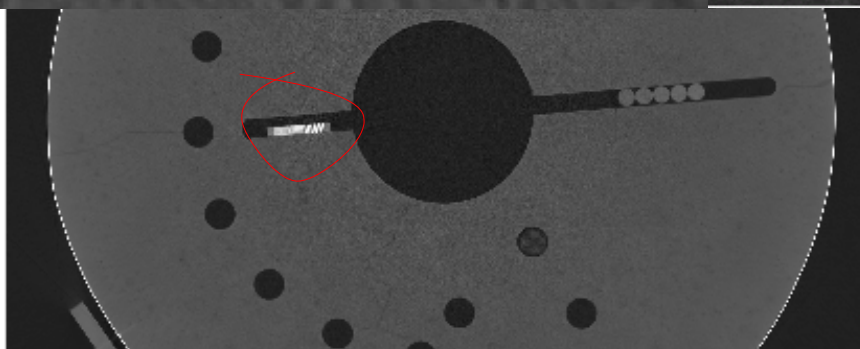
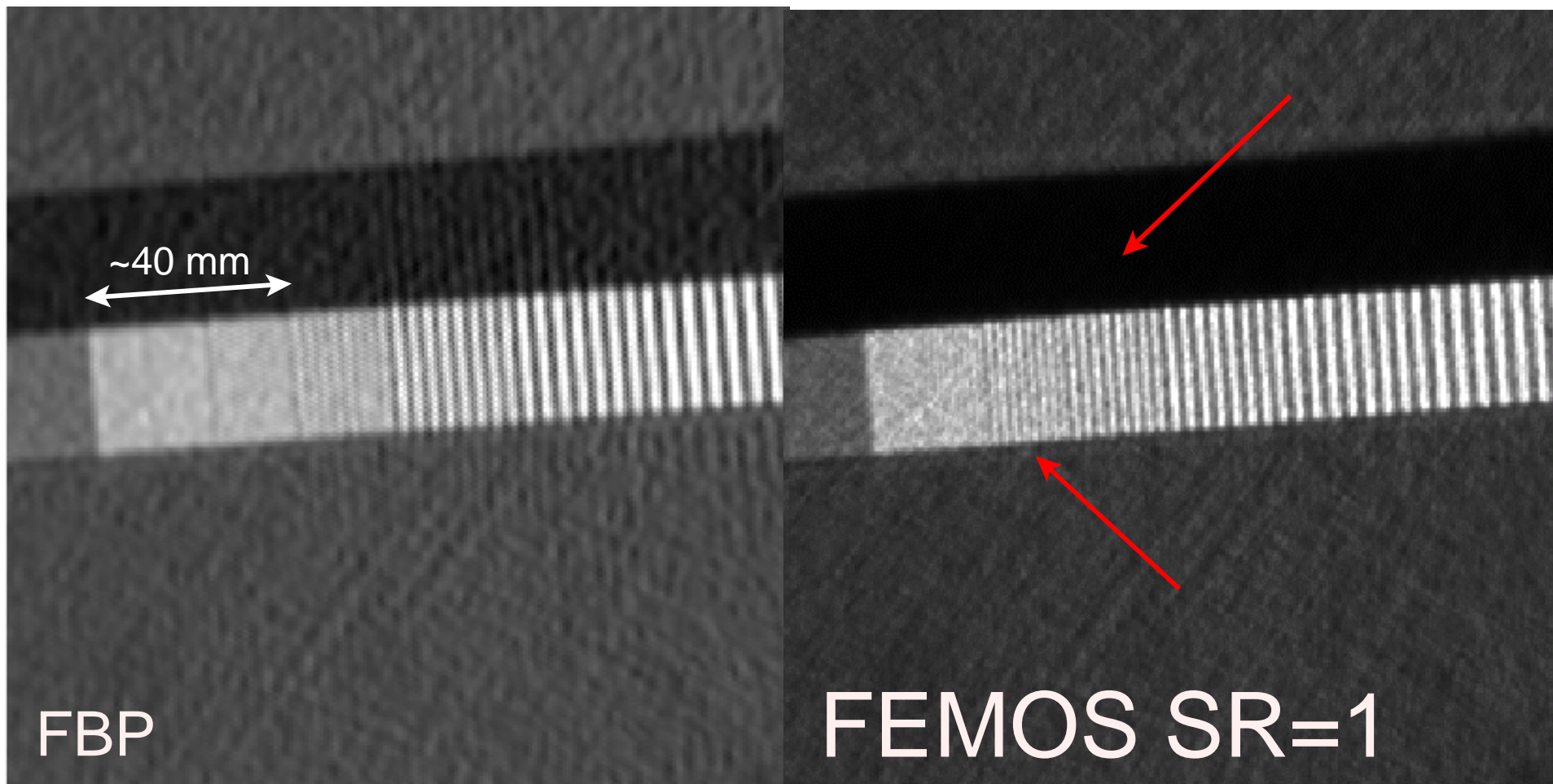


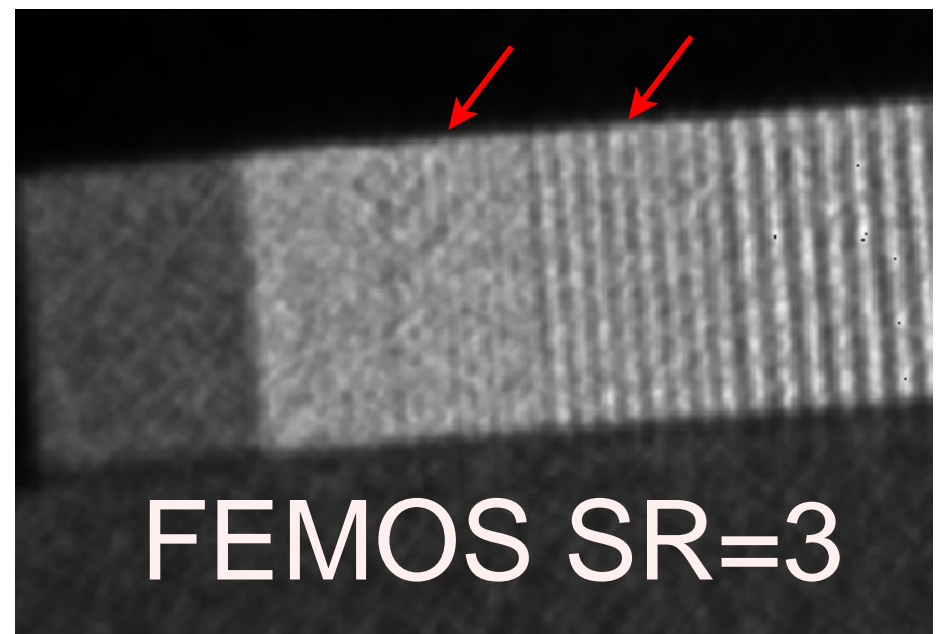
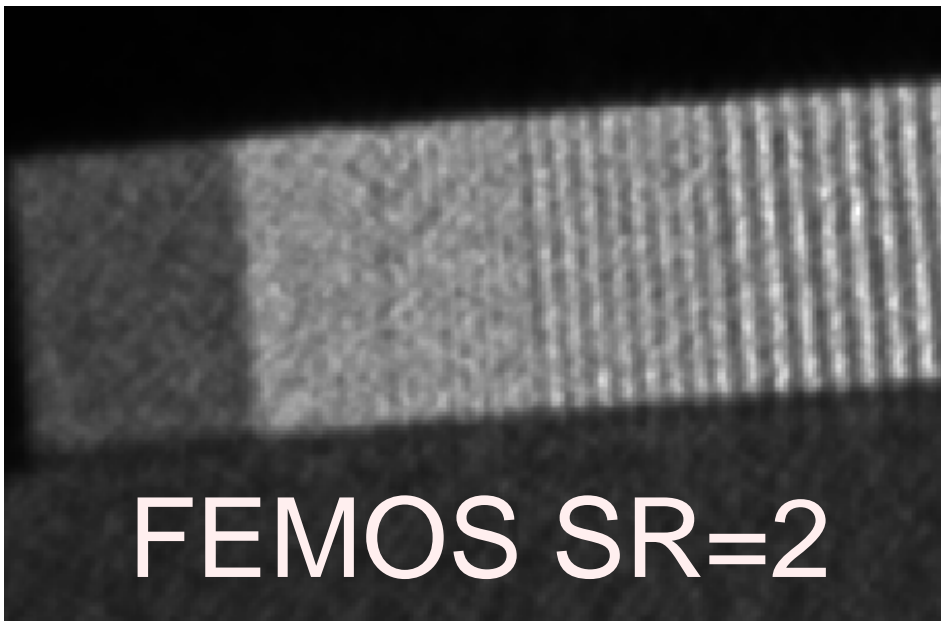
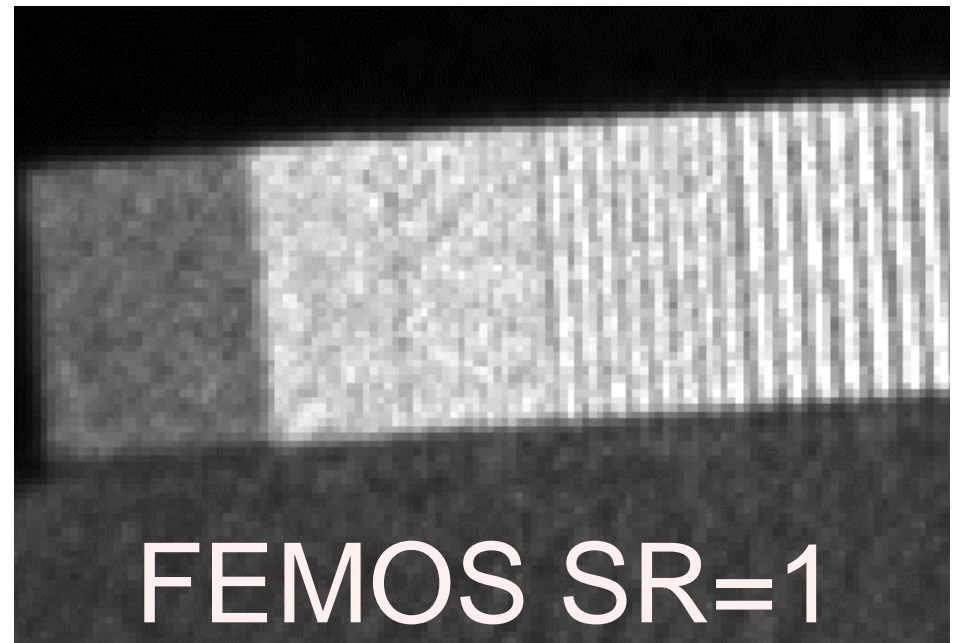
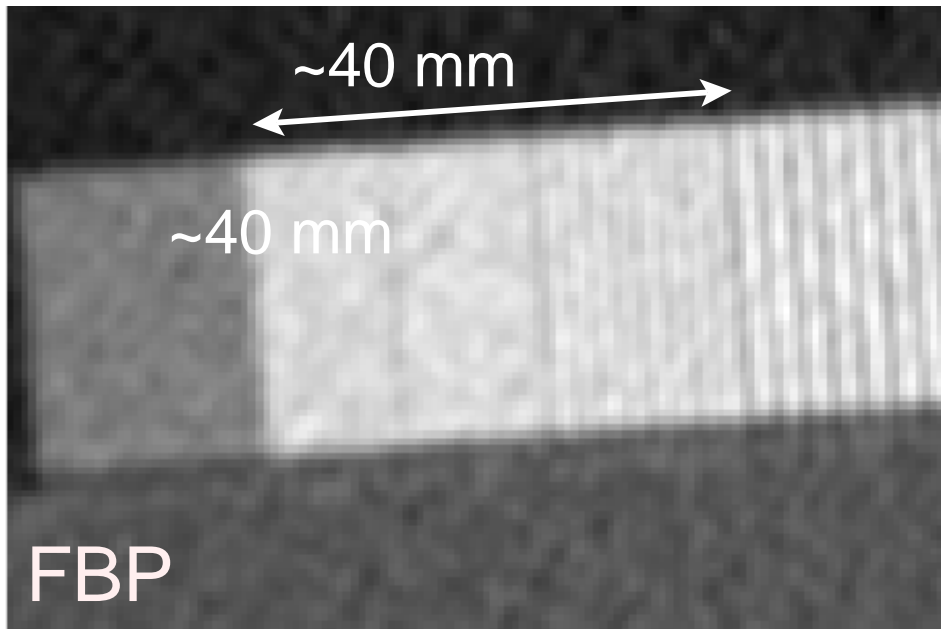
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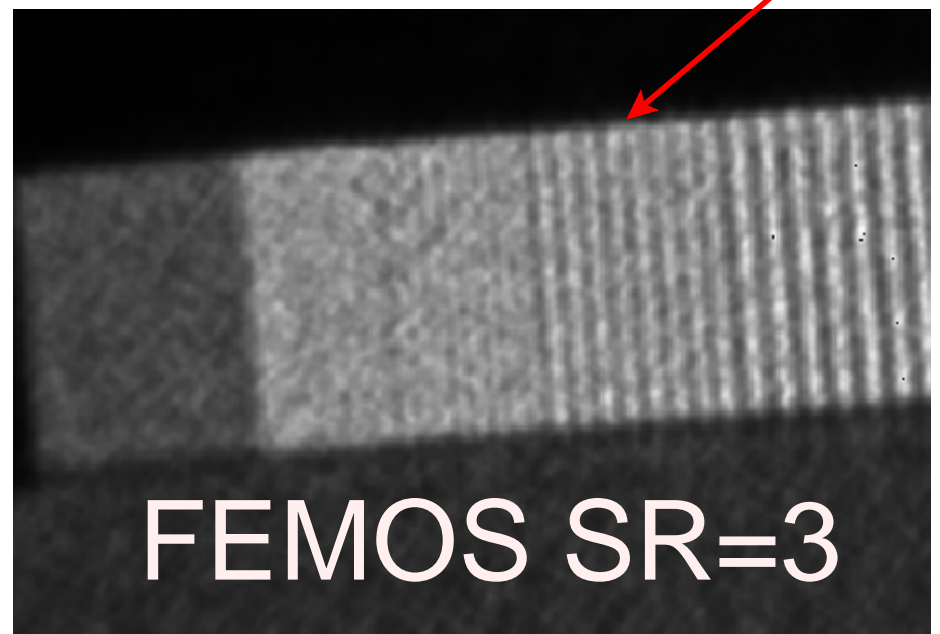
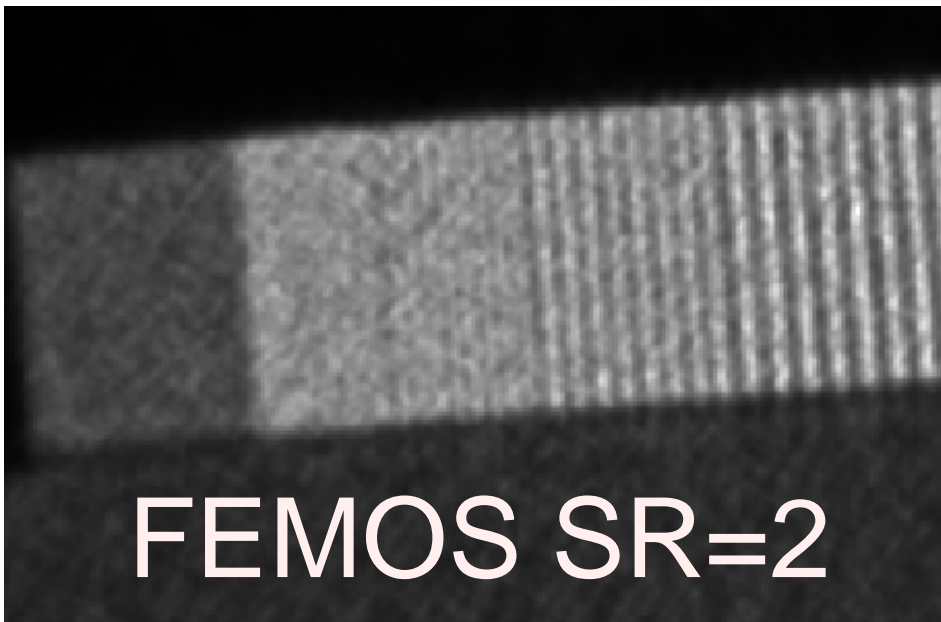
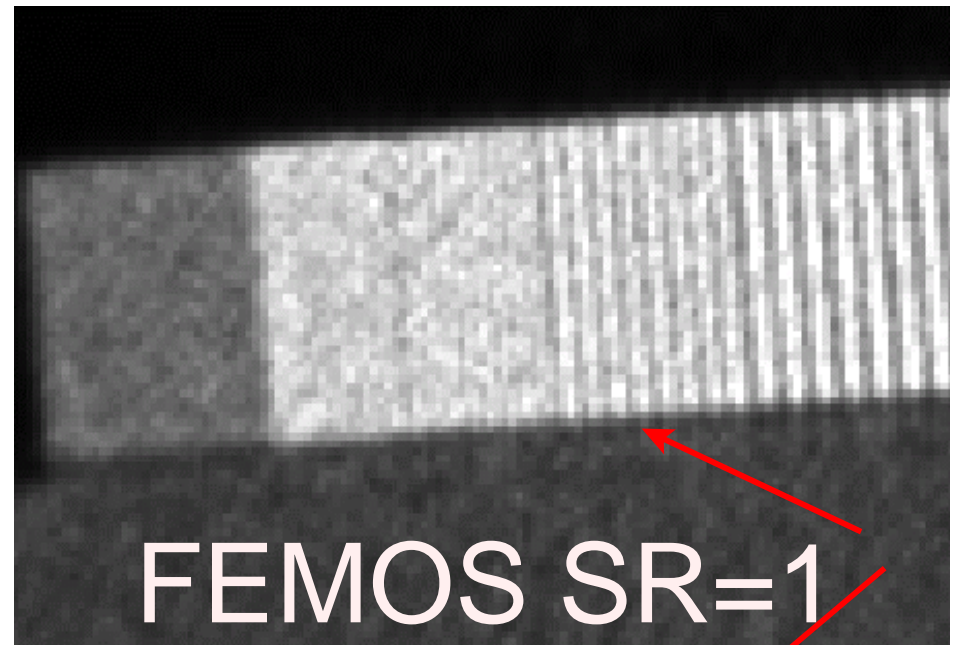
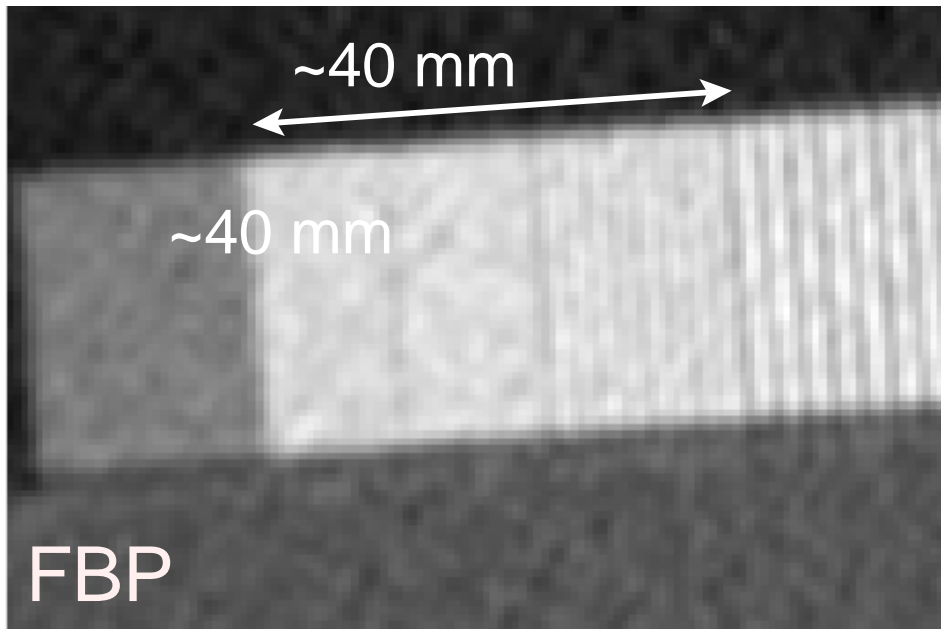


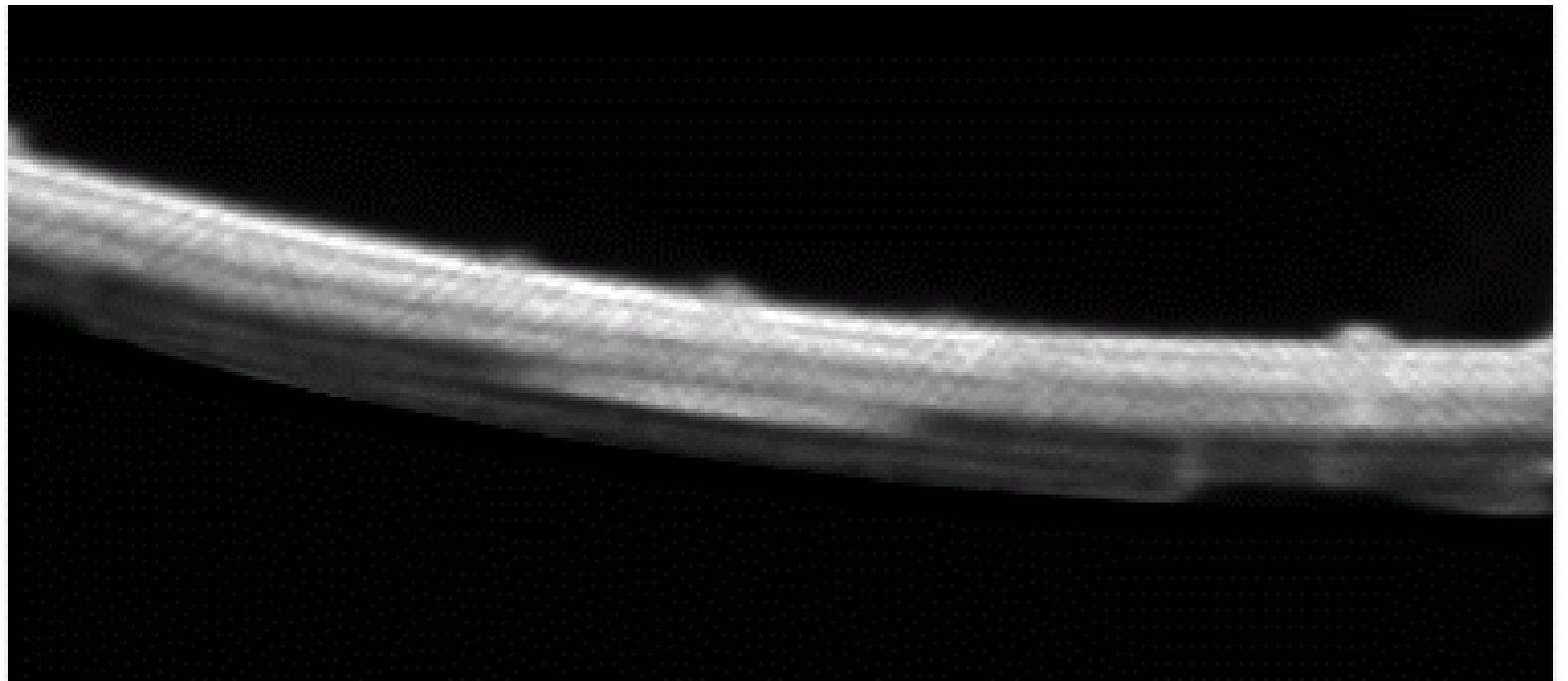
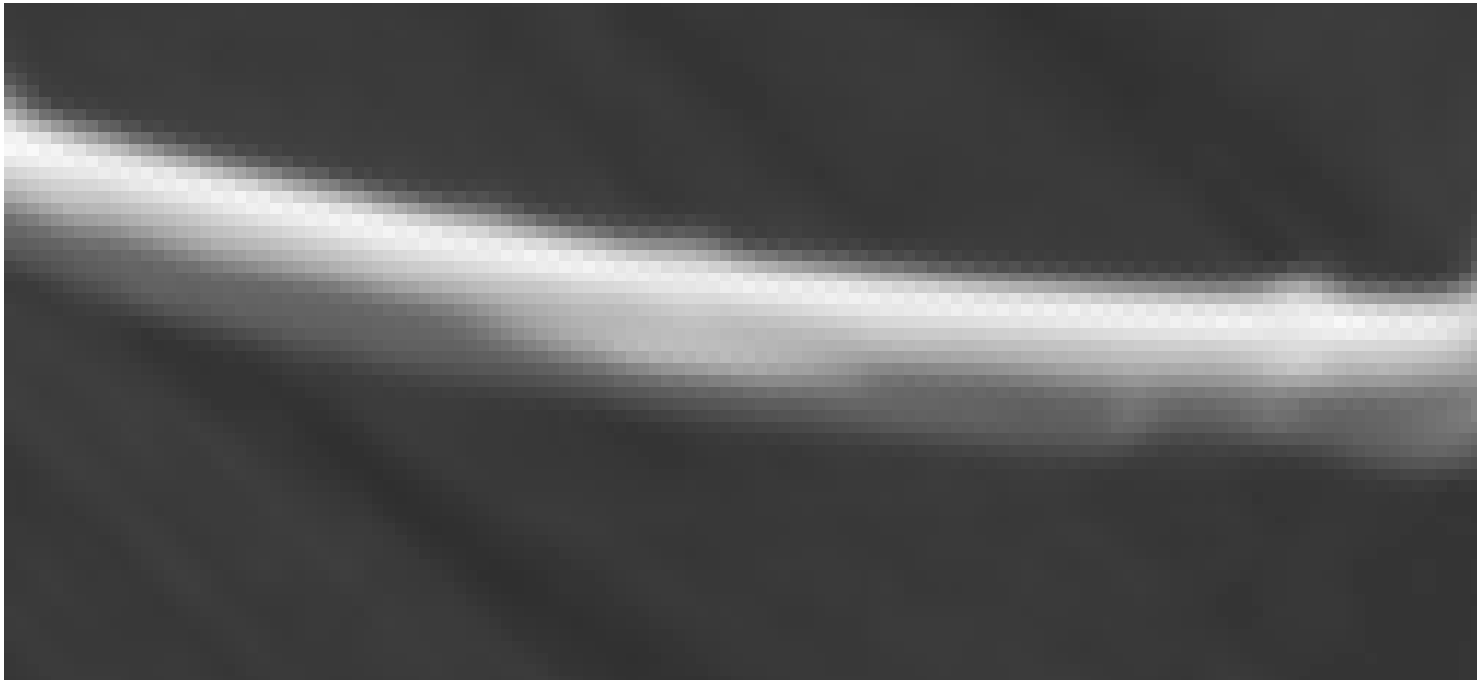




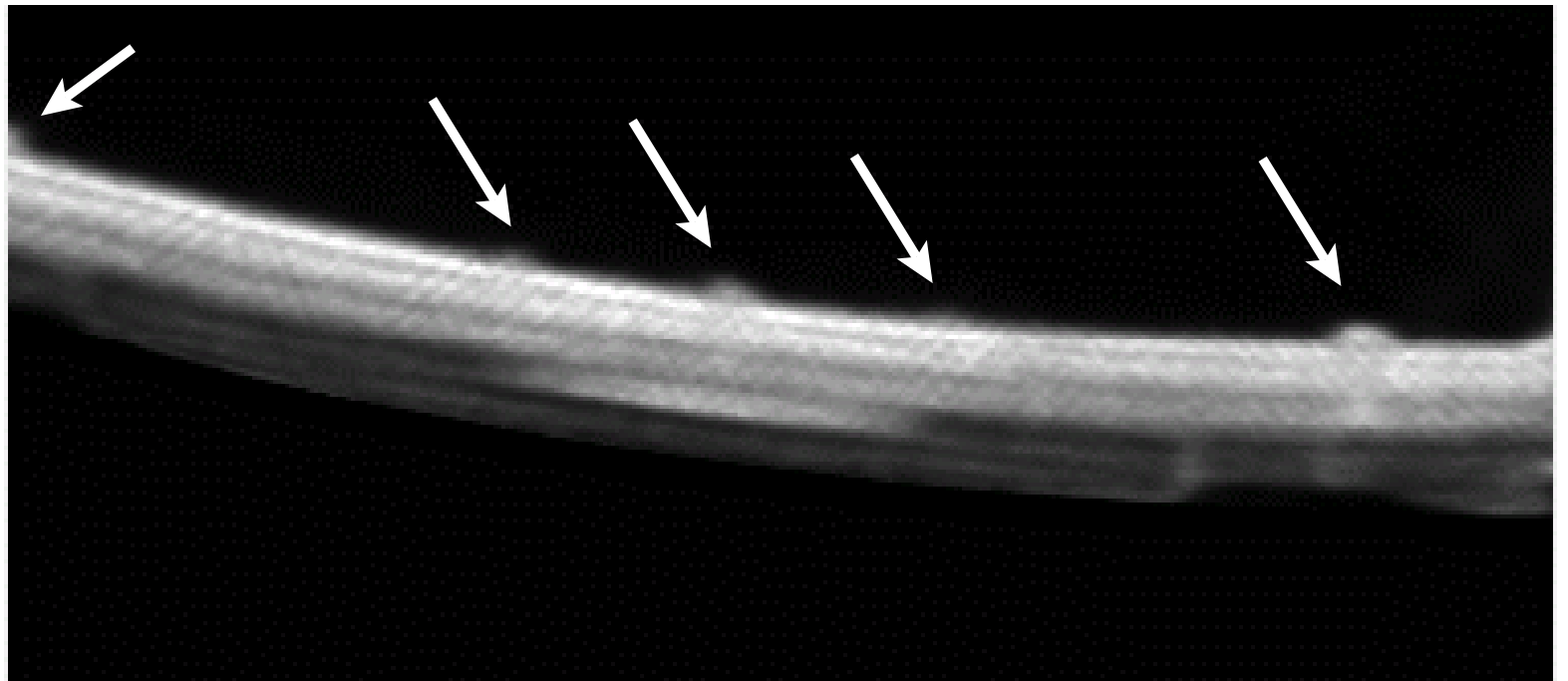
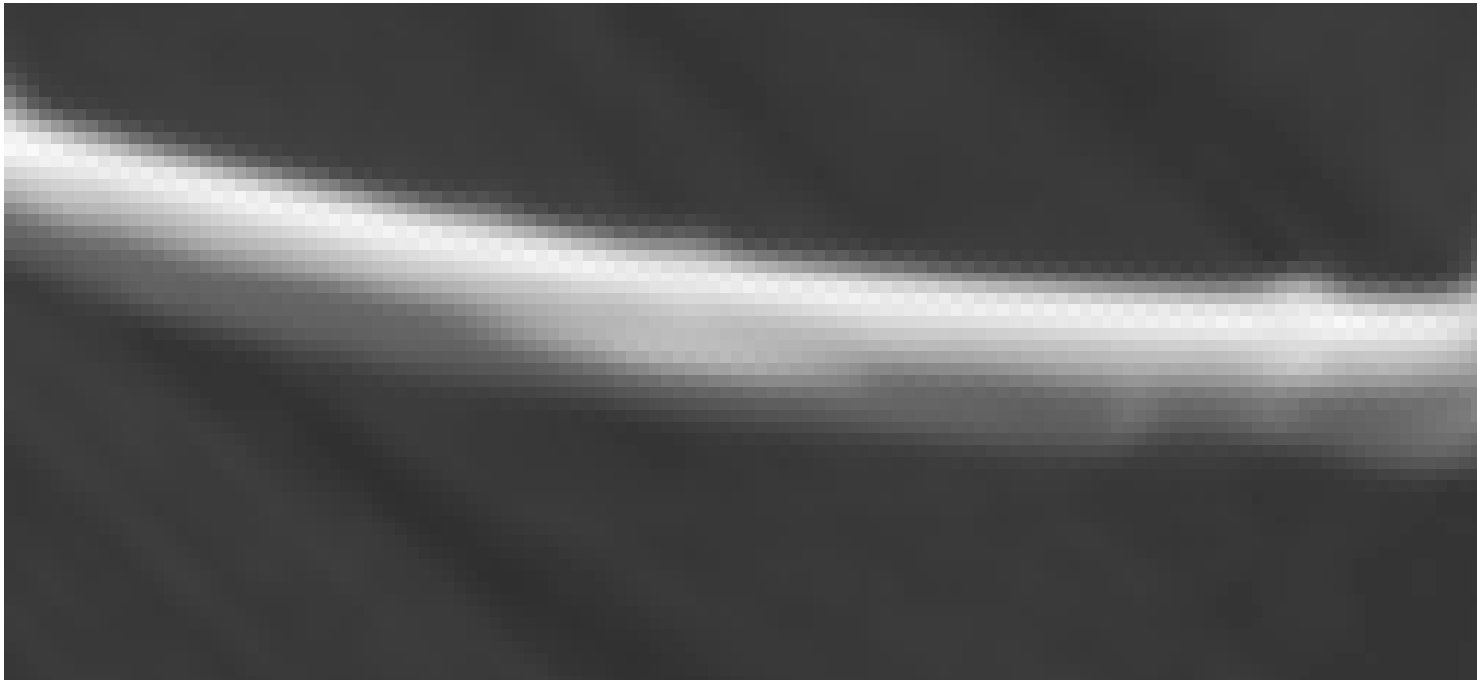




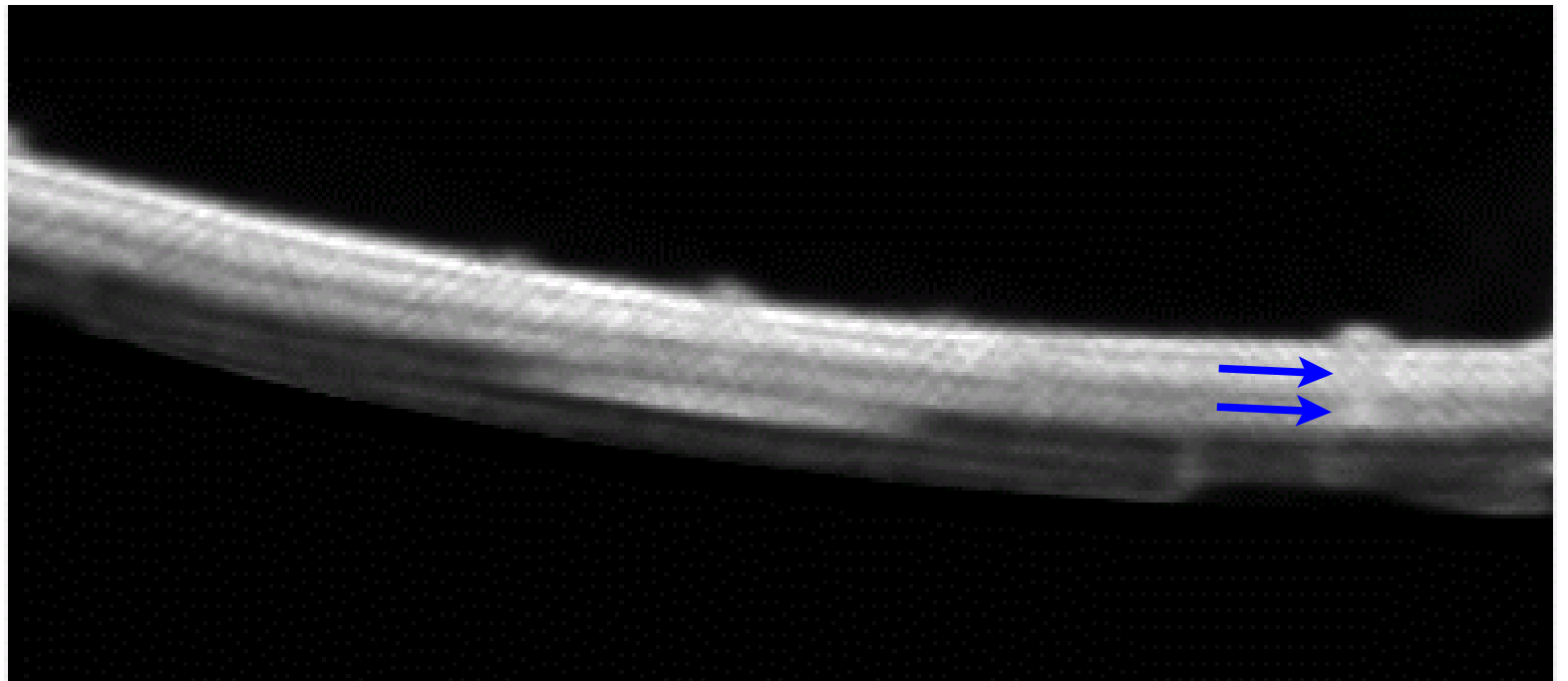
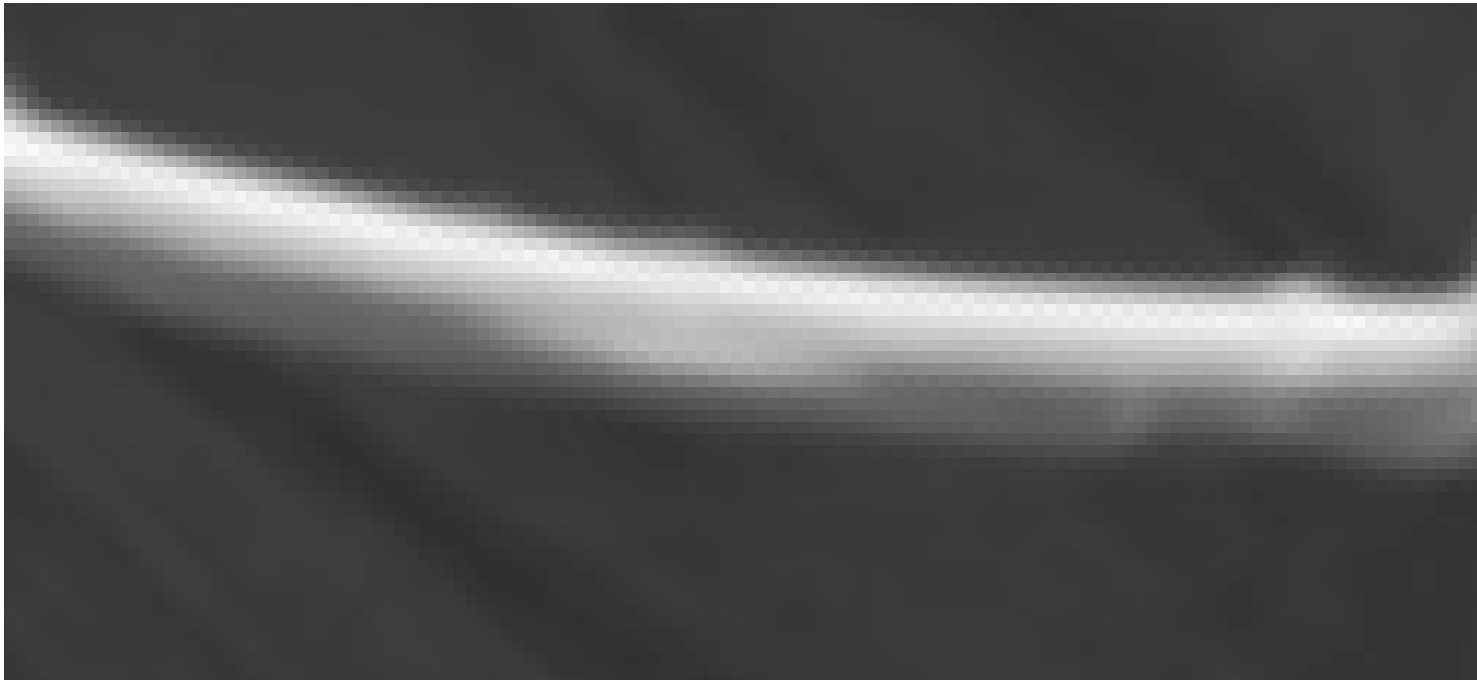




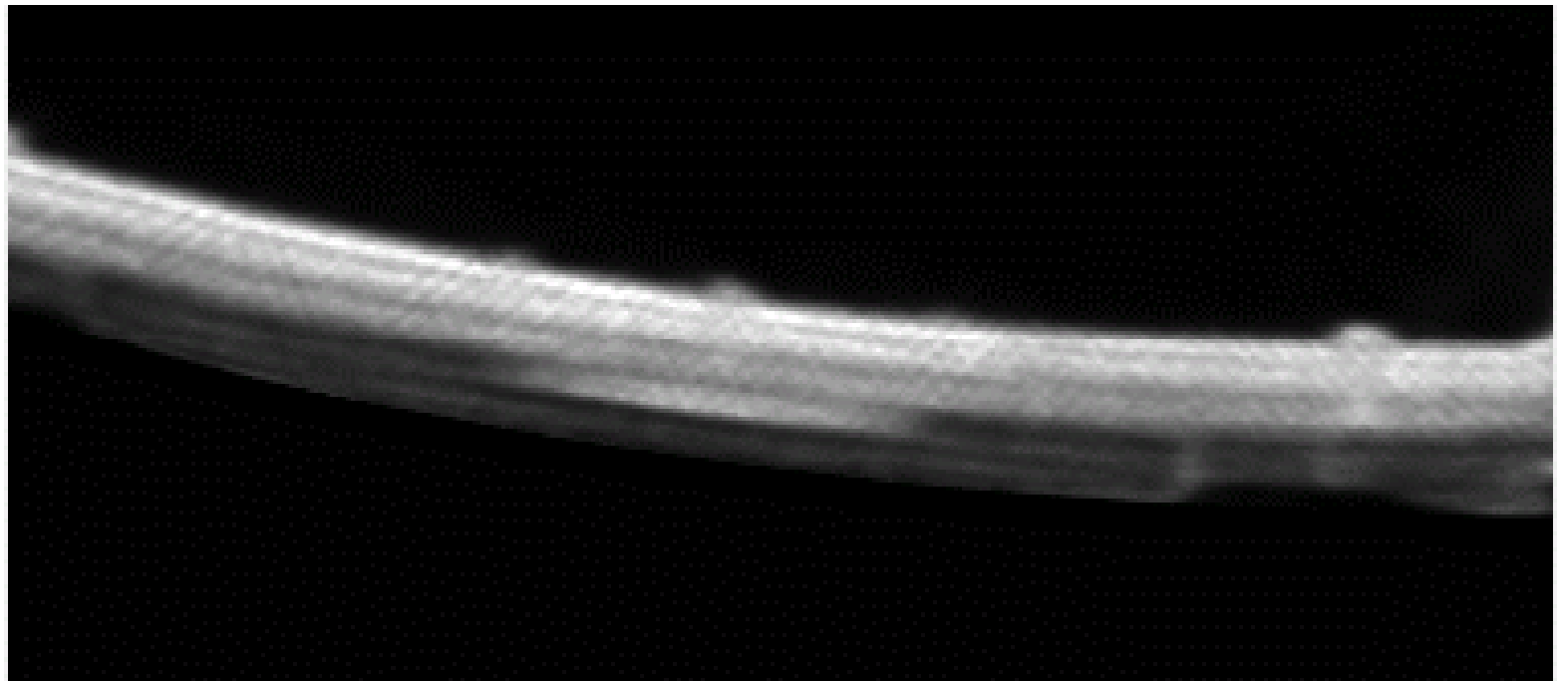
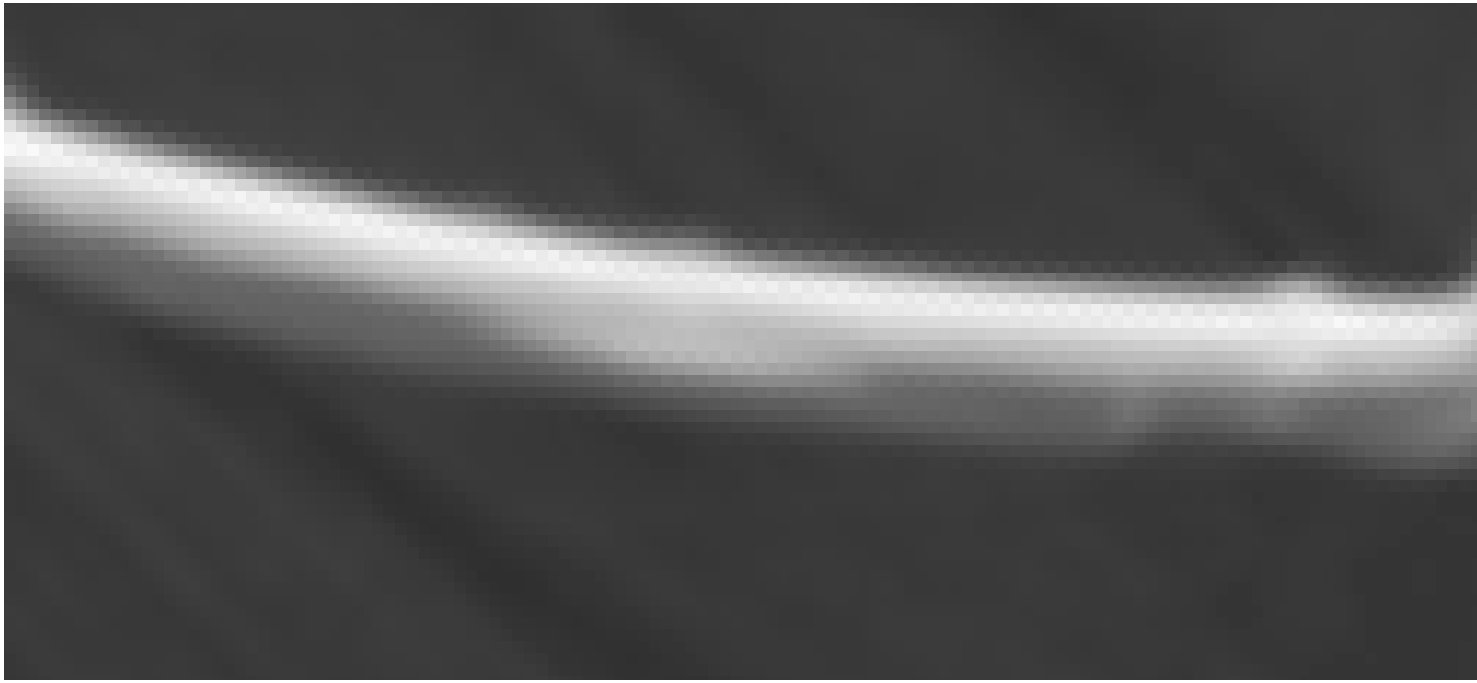
Distribution Statement A: Approved for public release, distribution is unlimited.



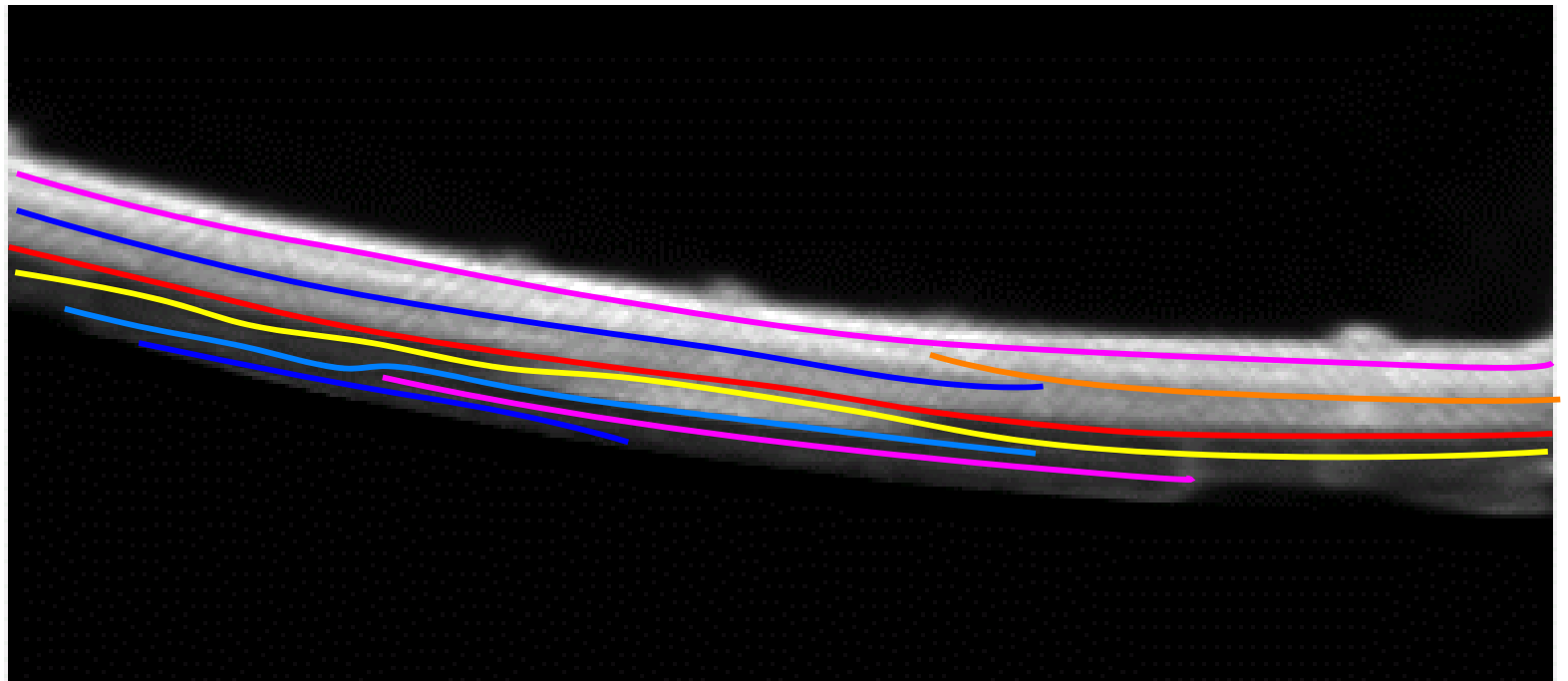
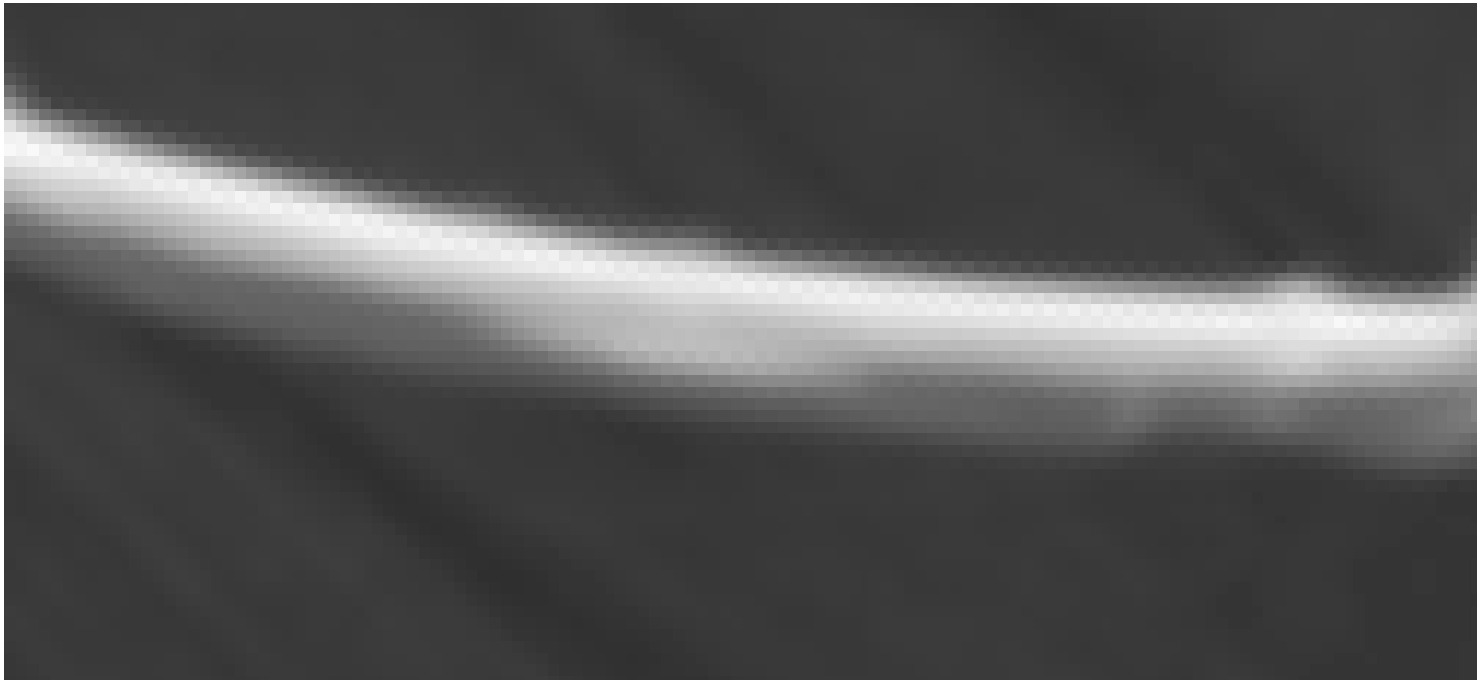
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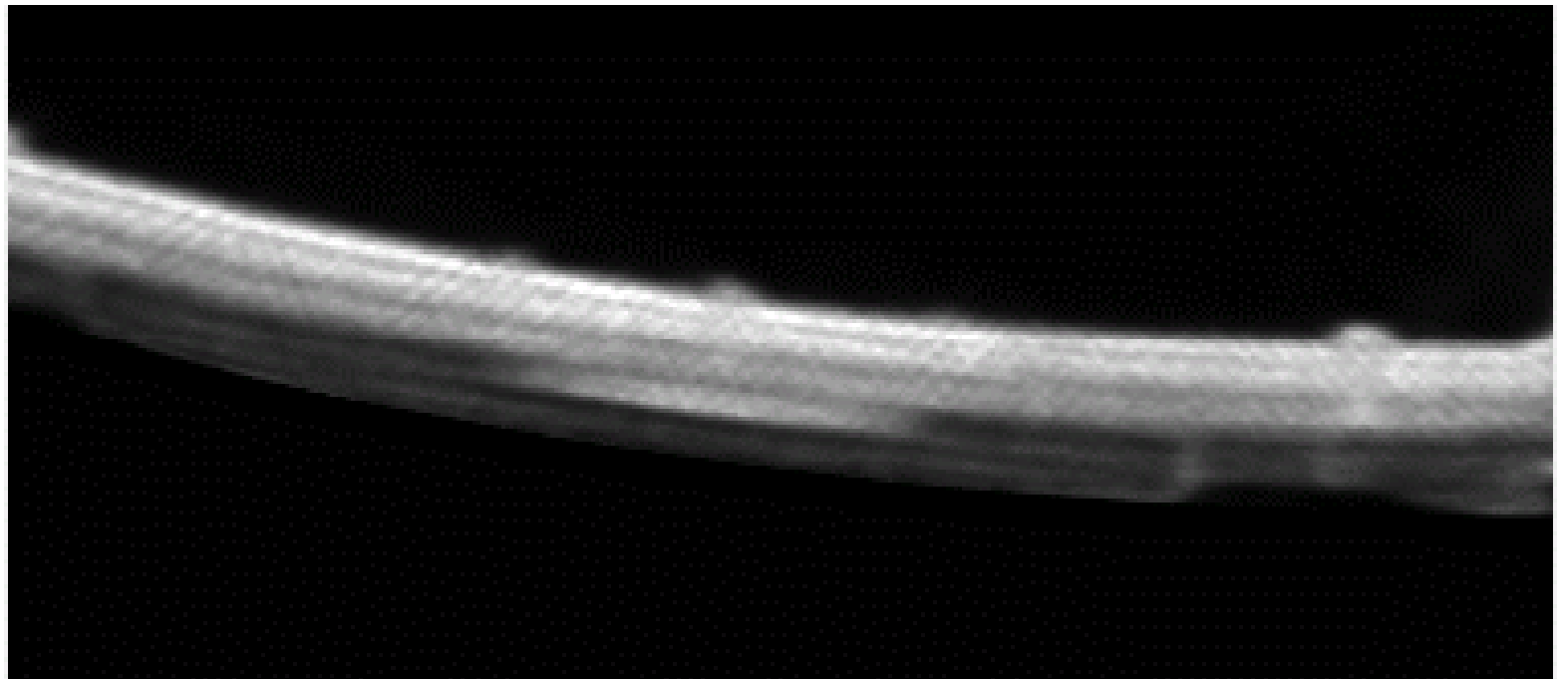
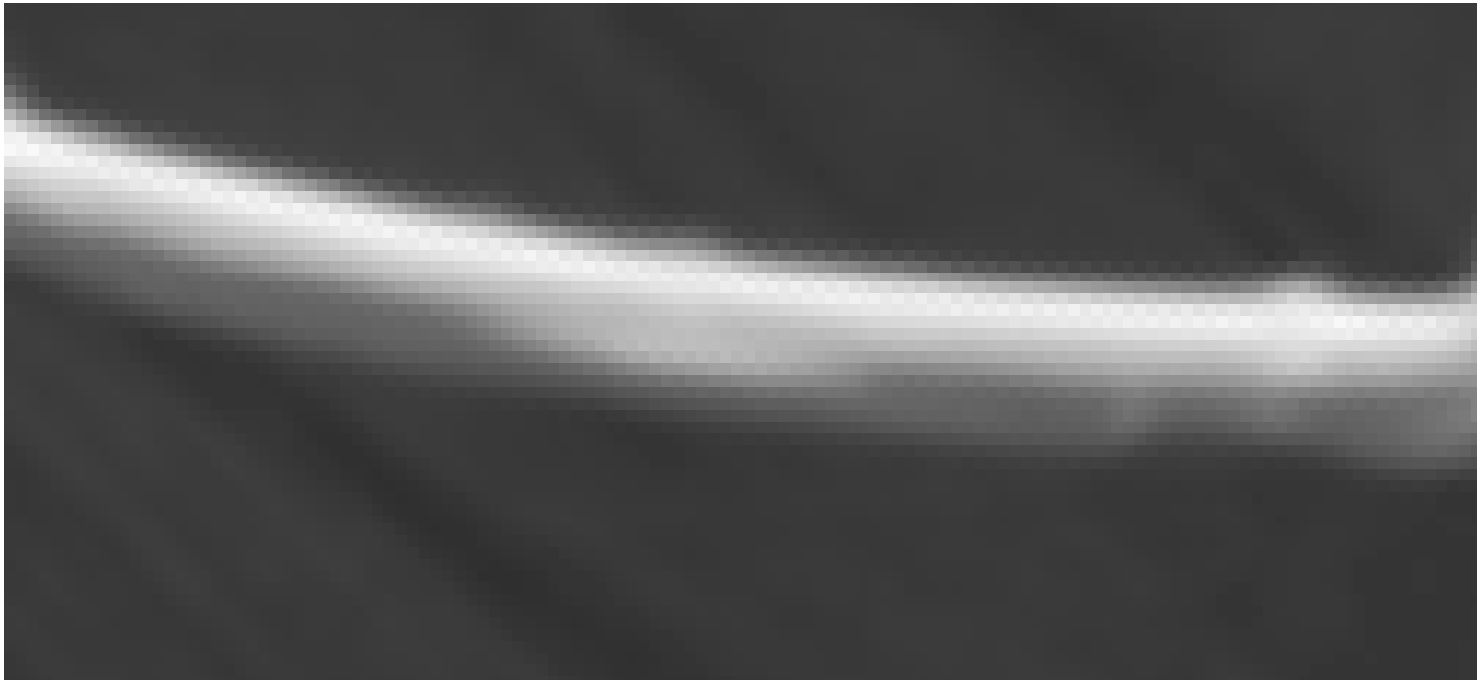
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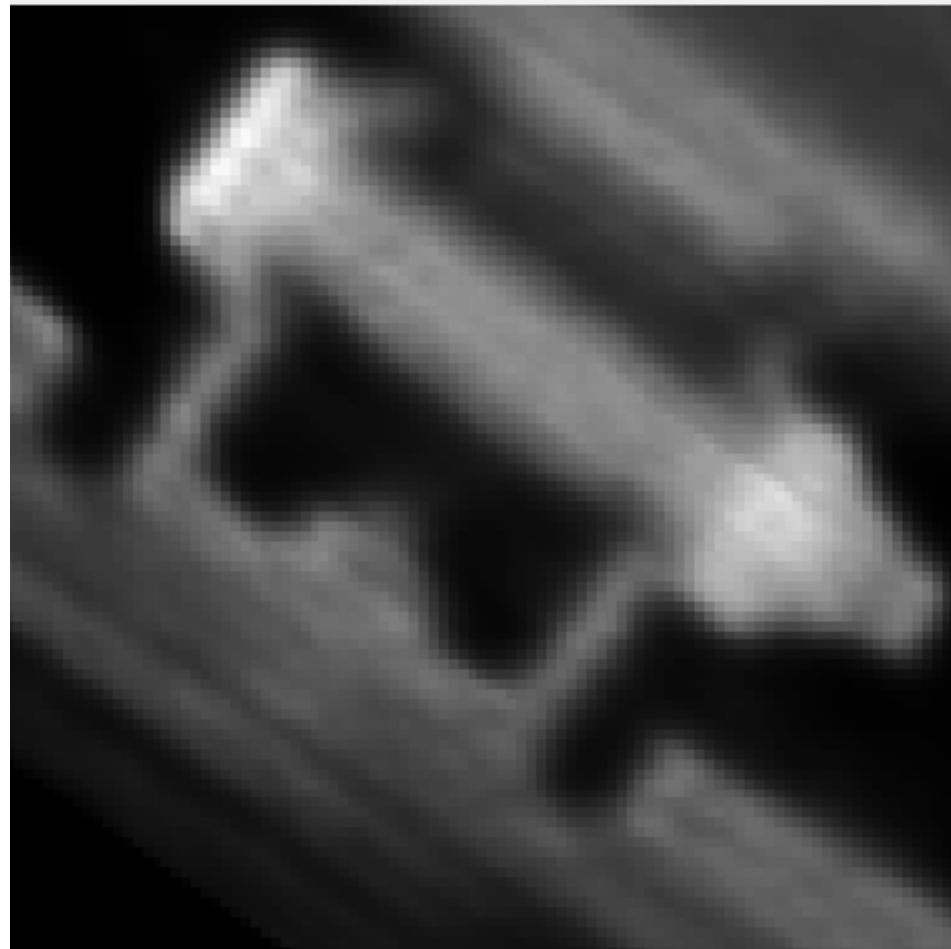
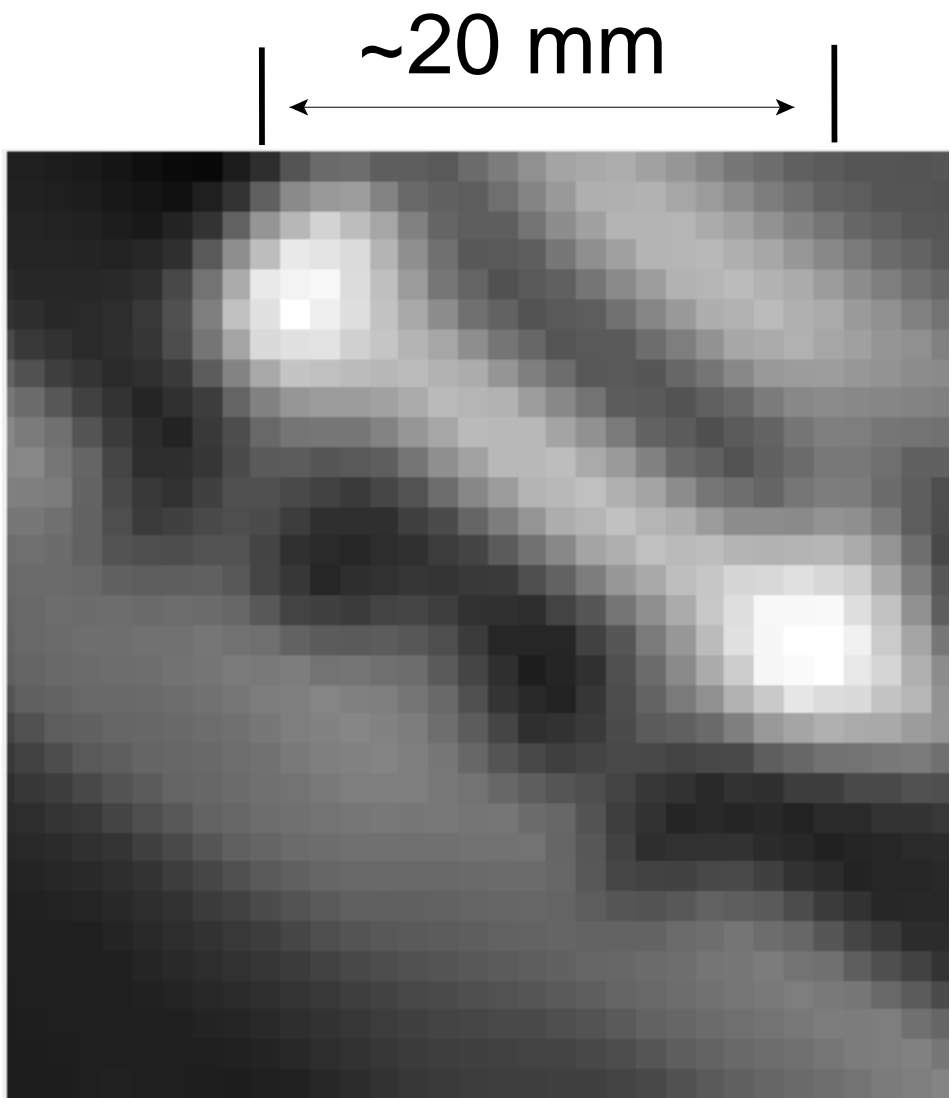
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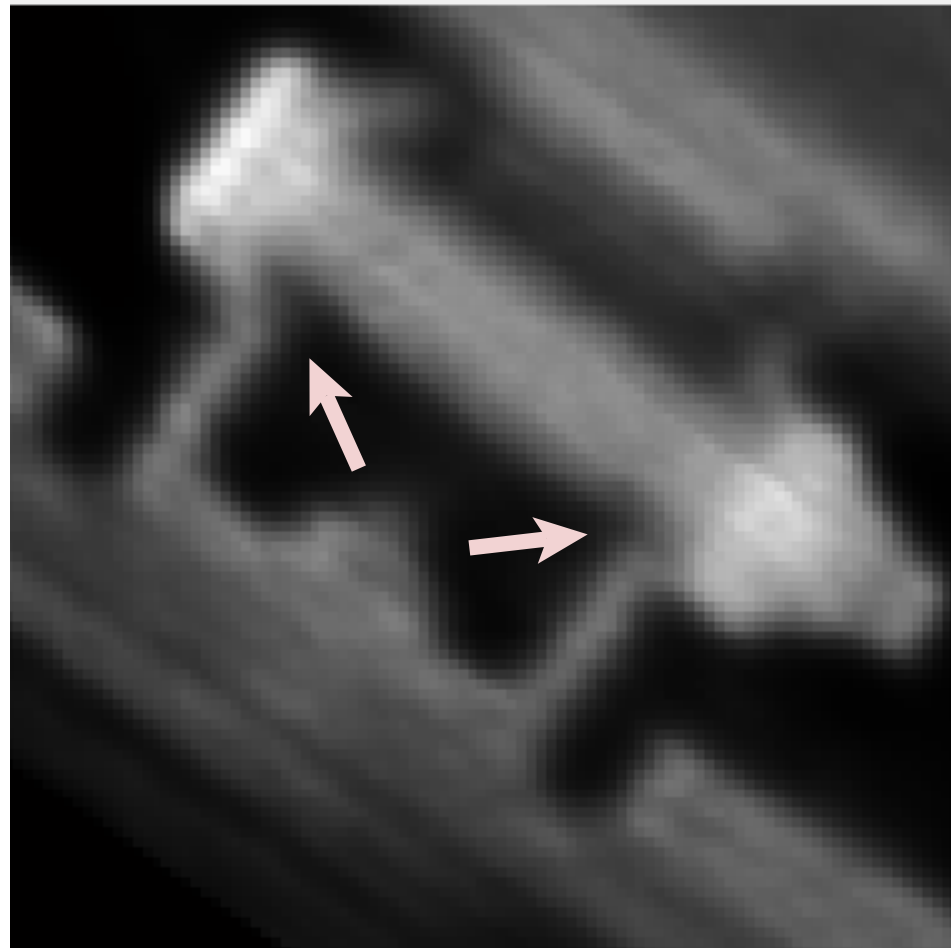
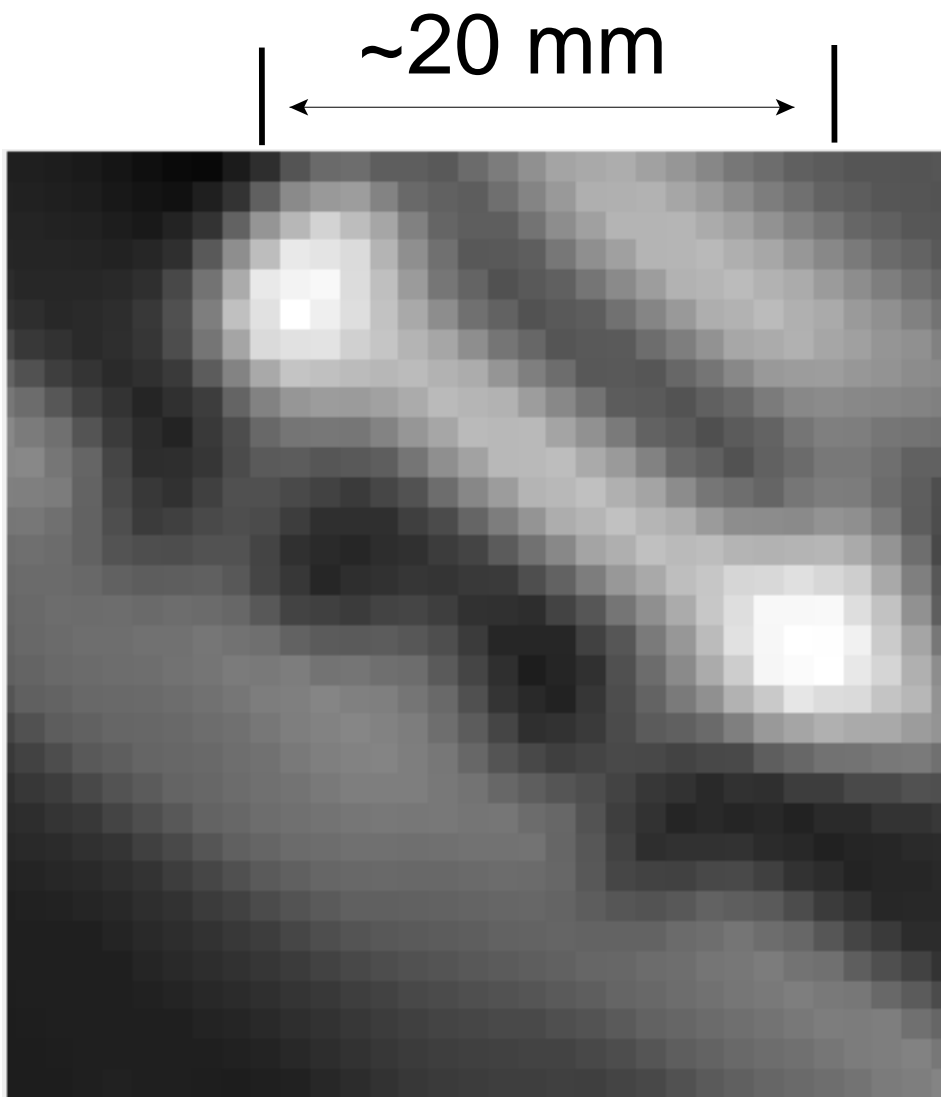


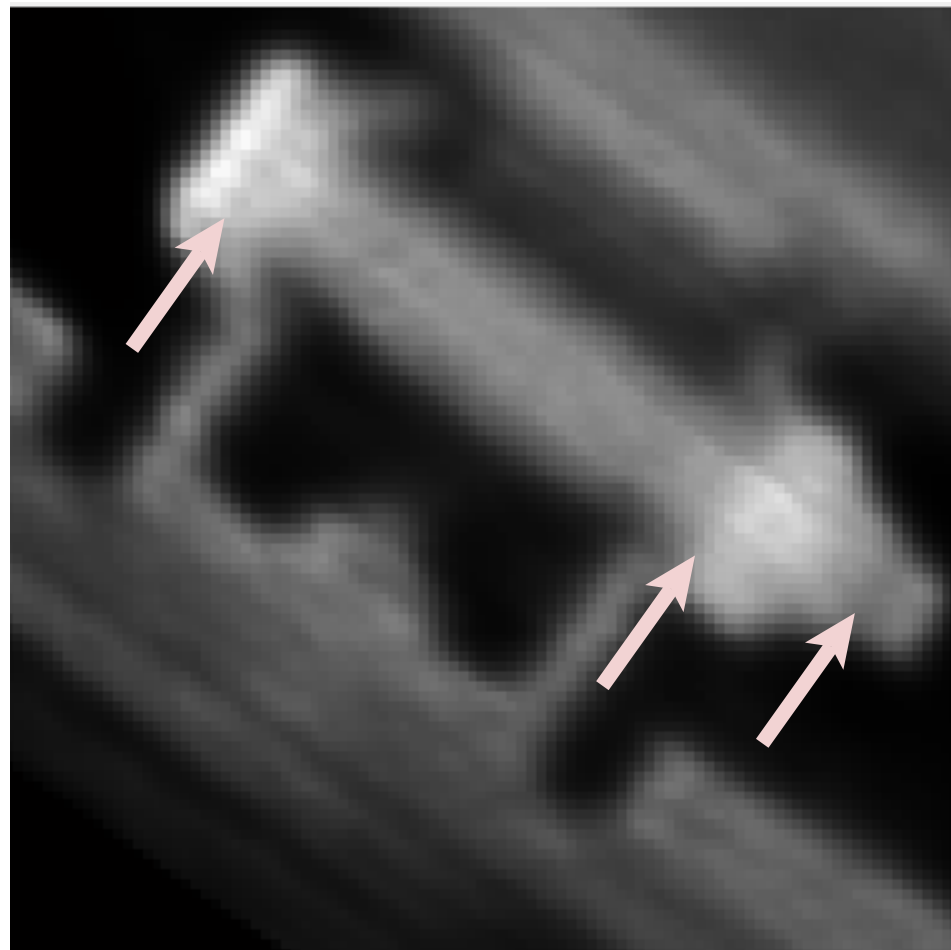
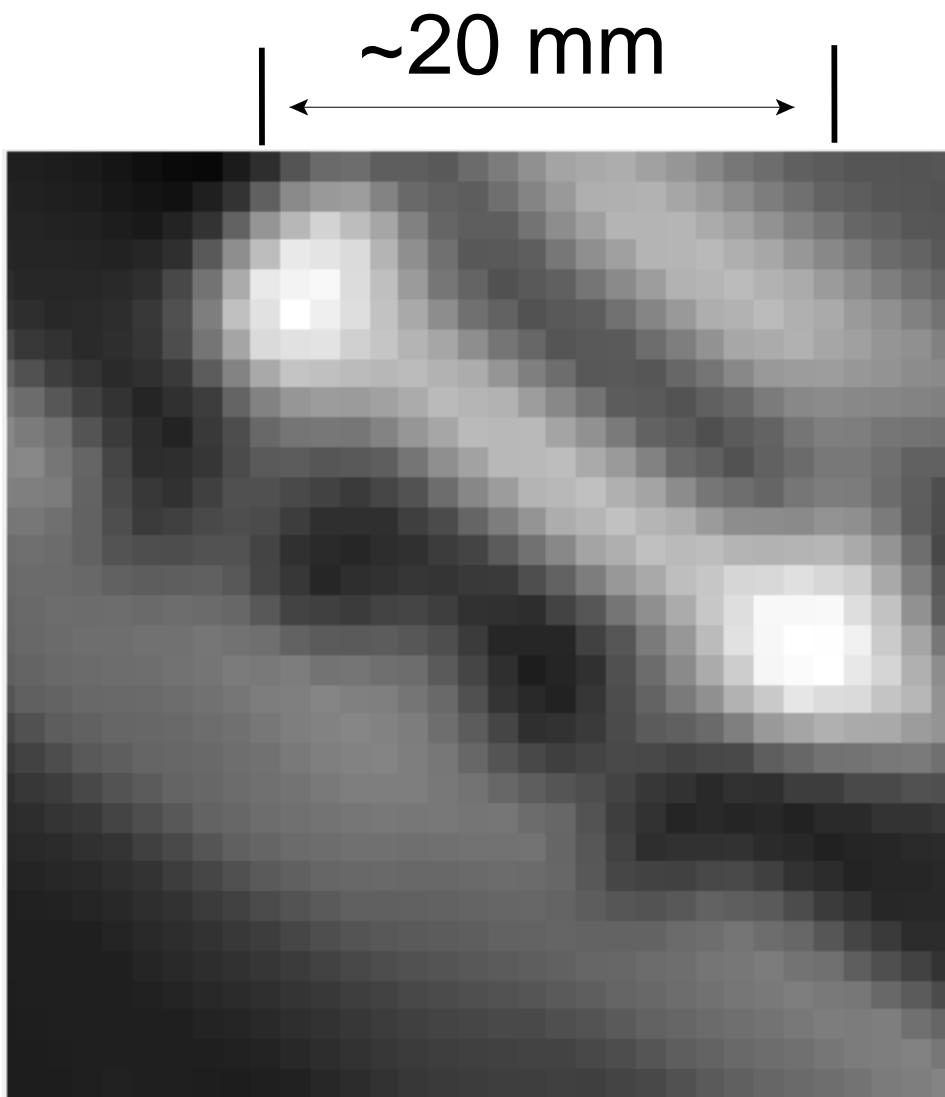
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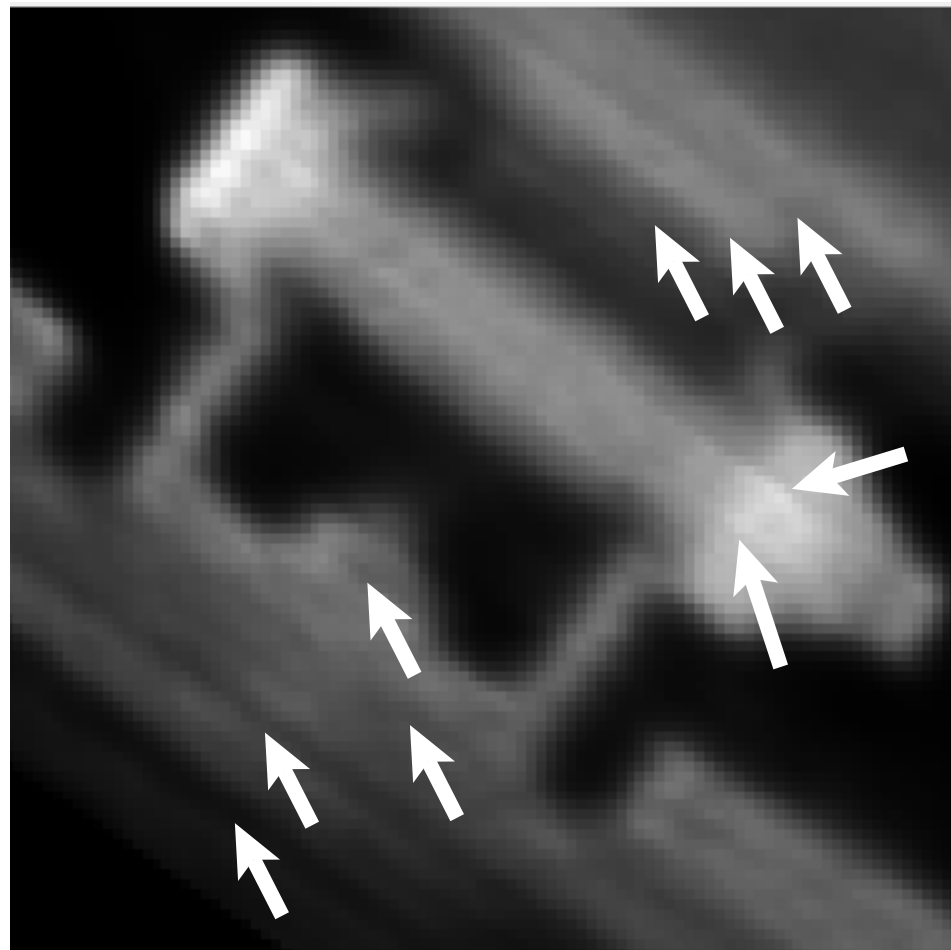
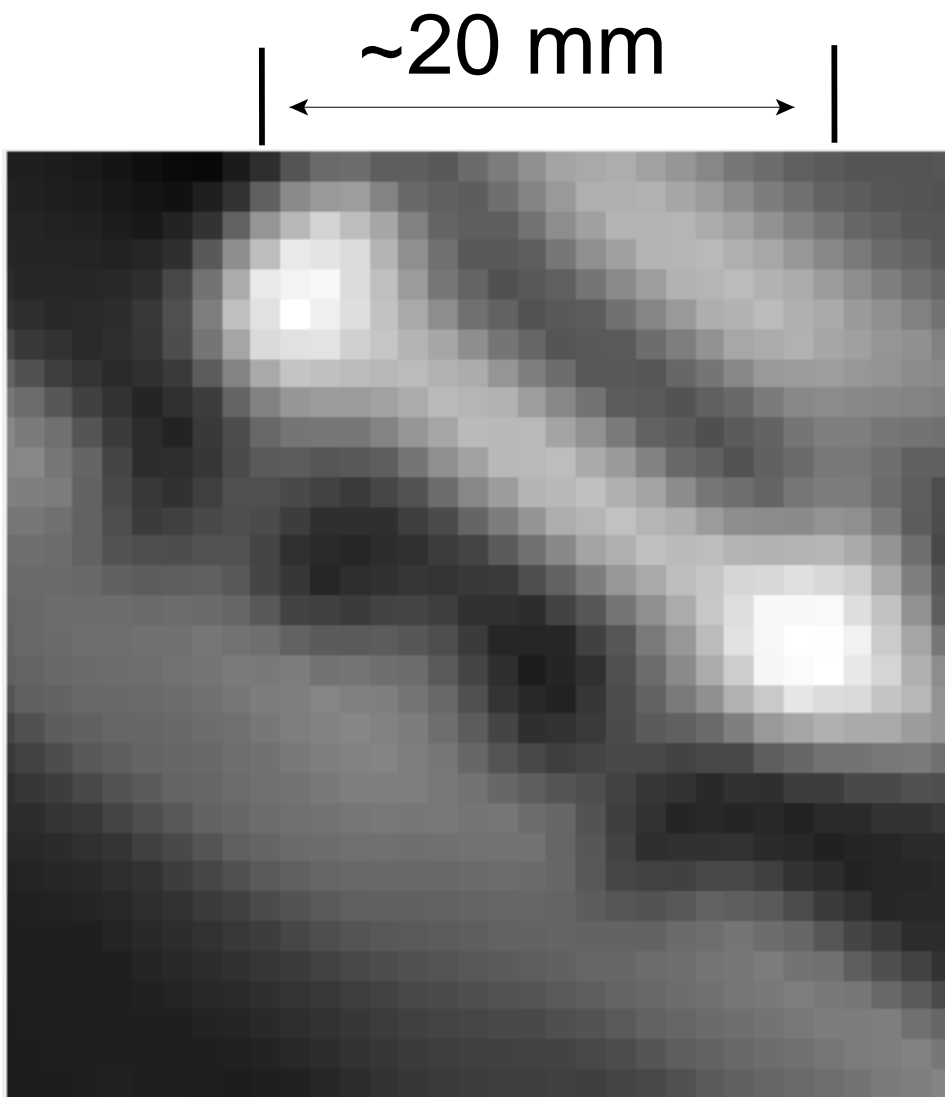


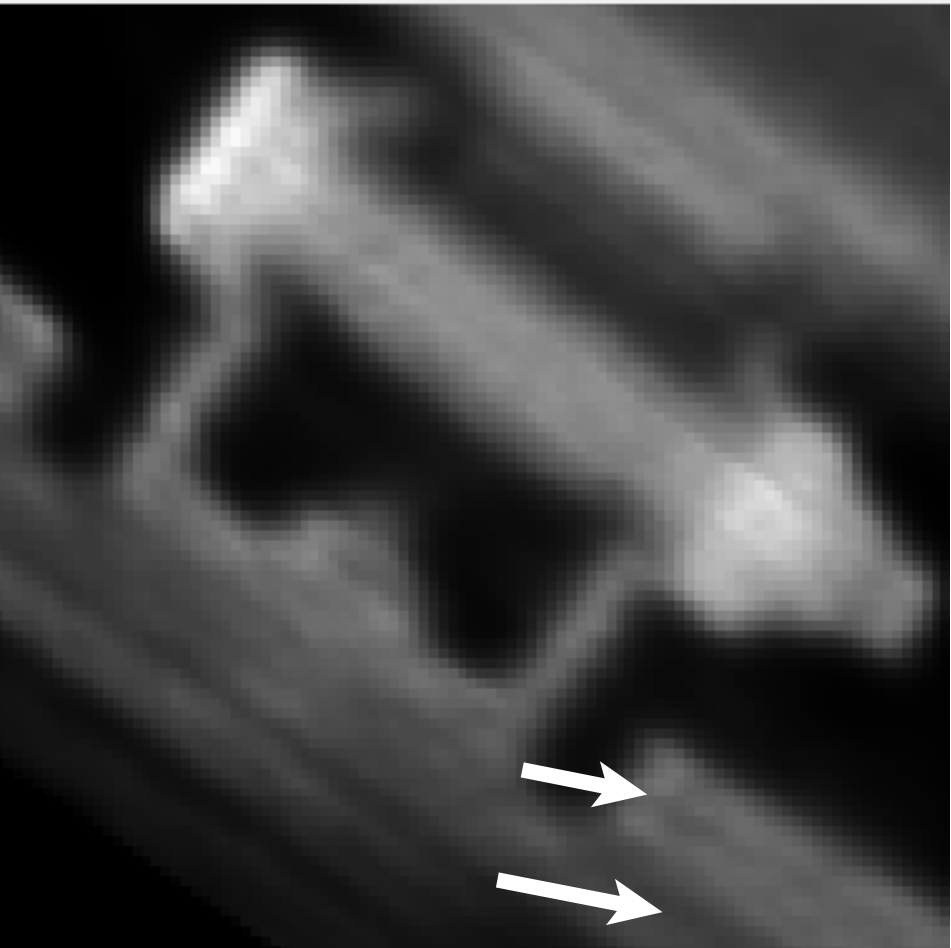
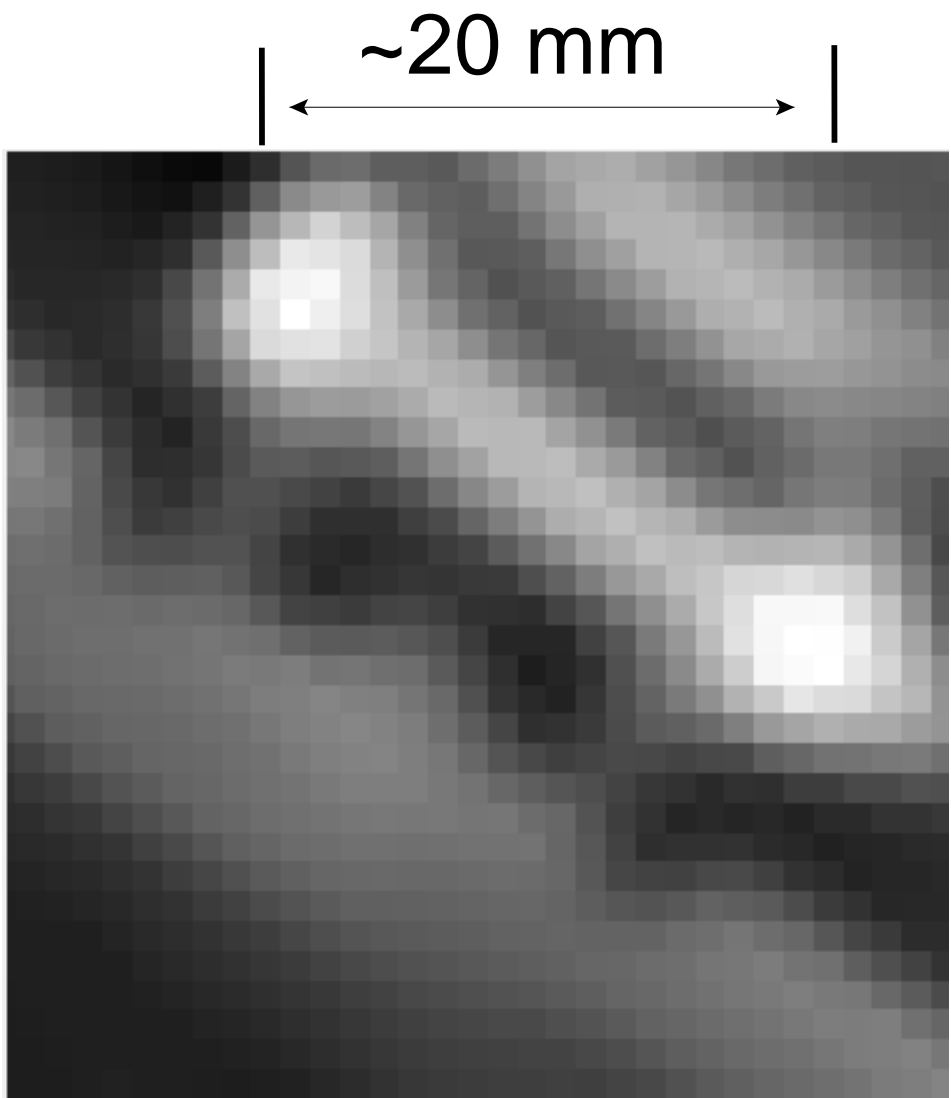
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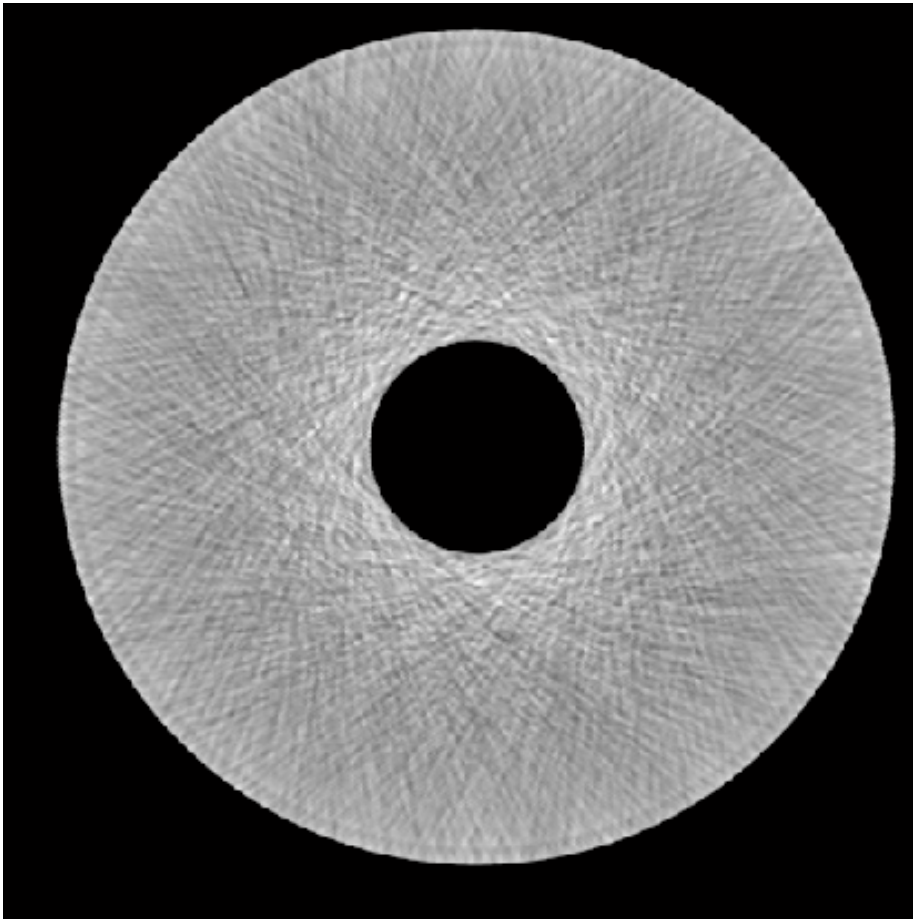






Low photon flux due to high attenuation

Filtered backprojection



EM

