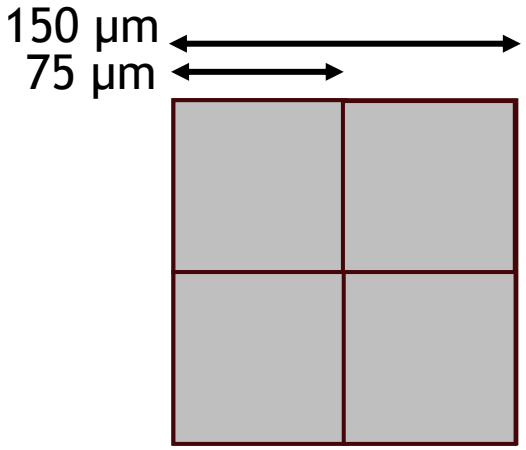
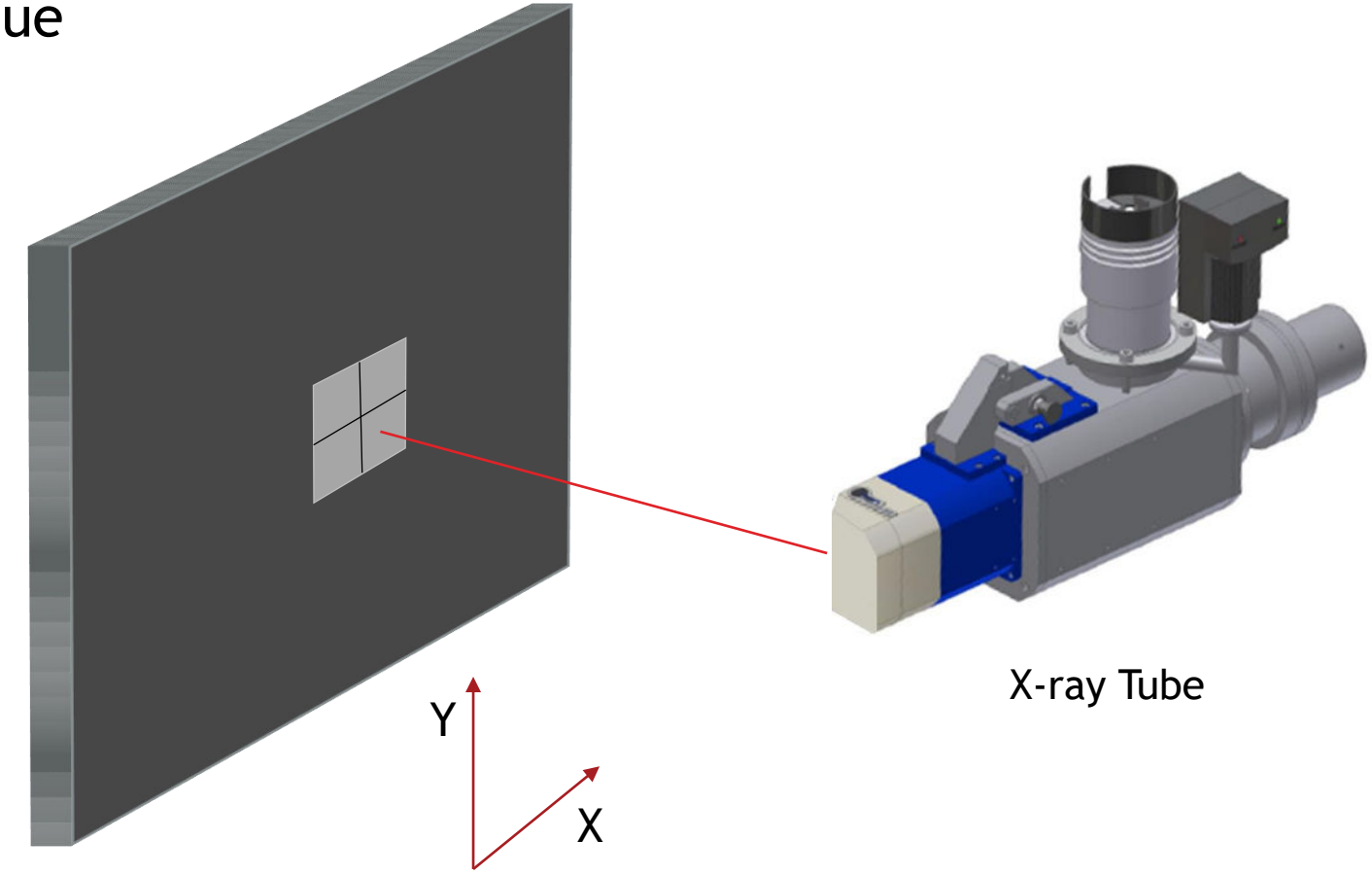
Accelerated SubpiX

efX 2.5 Release

SubpiX - What is it?

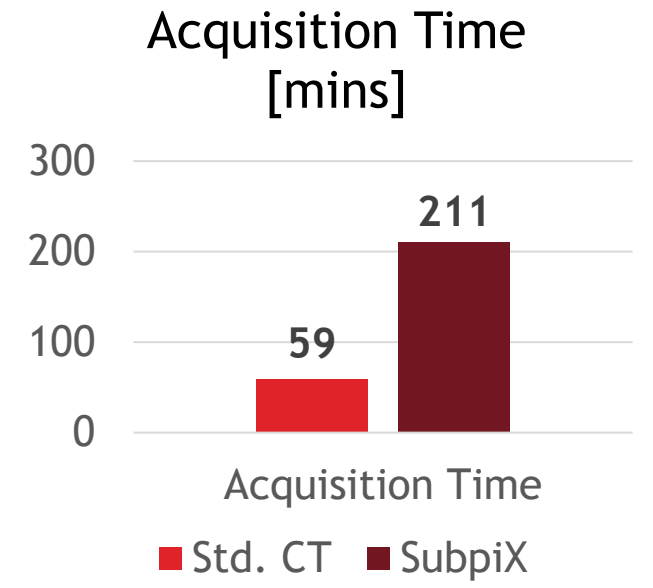
- Sub-pixel super resolution technique
- Subsamples a detector pixel
  - Acquires up to 4 radiographs/angle
  - Detector moves X & Y Axis

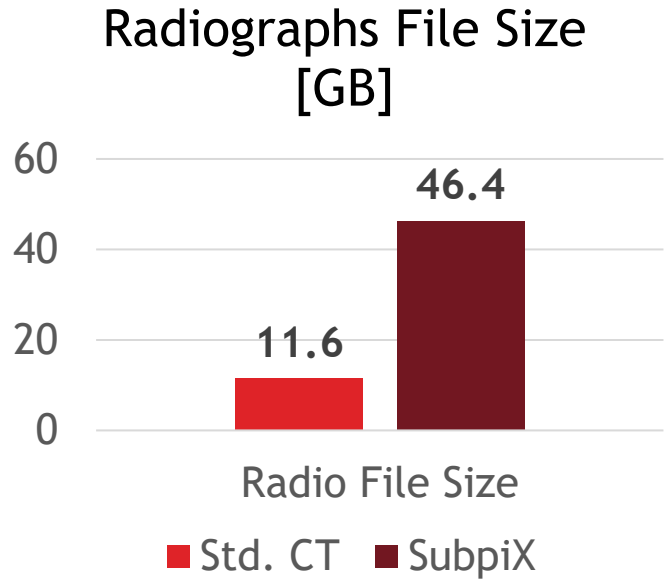




SubpiX - 4-Tile

- SubpiX 4-tile was the only capability up until efX 2.5
- Improves reconstruction quality
- Compared to Standard CT:
  - 4x number of radiographs acquired
  - 4x longer acquisition time
  - 4x larger file footprint
  - Example: 2000 projections, 8 MB
    - 8000 radiographs, ~64 GB

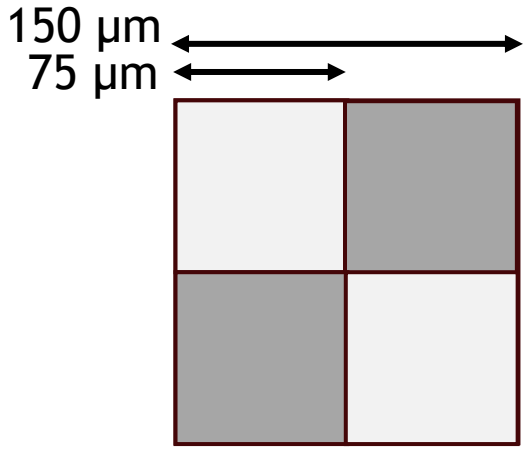




Solution - Accelerated SubpiX

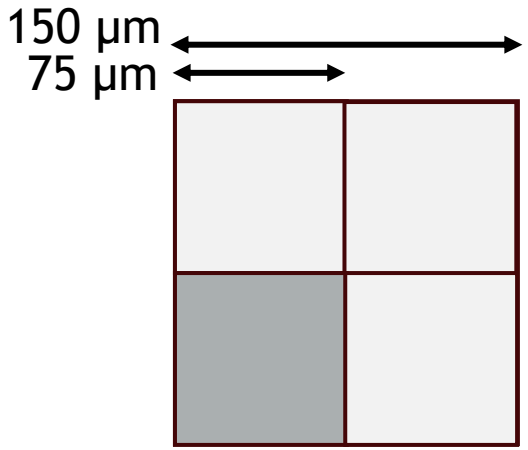
Accelerated 2-Tile

- 2 radiographs / angle
- Ex: 2,000 projections
  - 4,000 radiographs



Accelerated 1-Tile

- 1 radiograph / angle
- Ex: 2,000 projections
  - 2,000 radiographs



NORTH STAR IMAGING

Application: Metal Castings

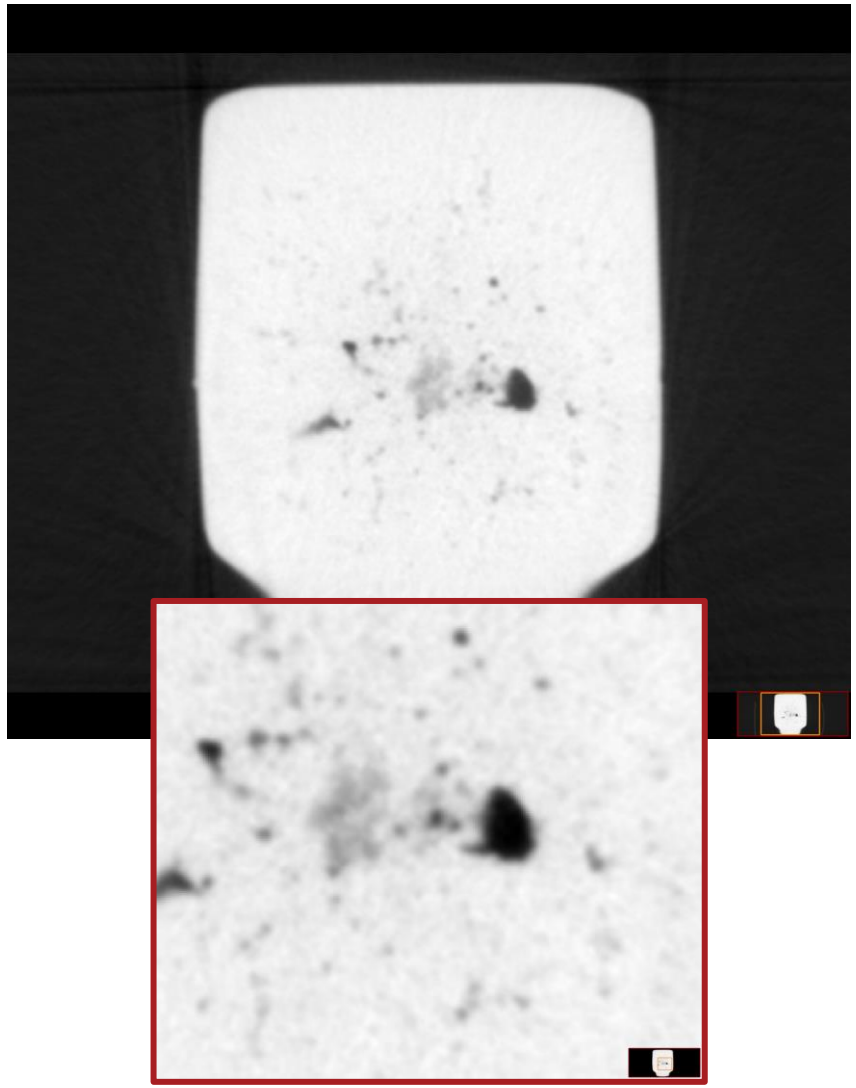
- Source: Microfocus, 210 kV, 400 µA
- Detector: 12.5 FPS, 10 Fr. Avg.
    - Pitch: 127 µm
- Magnification: 1.48x

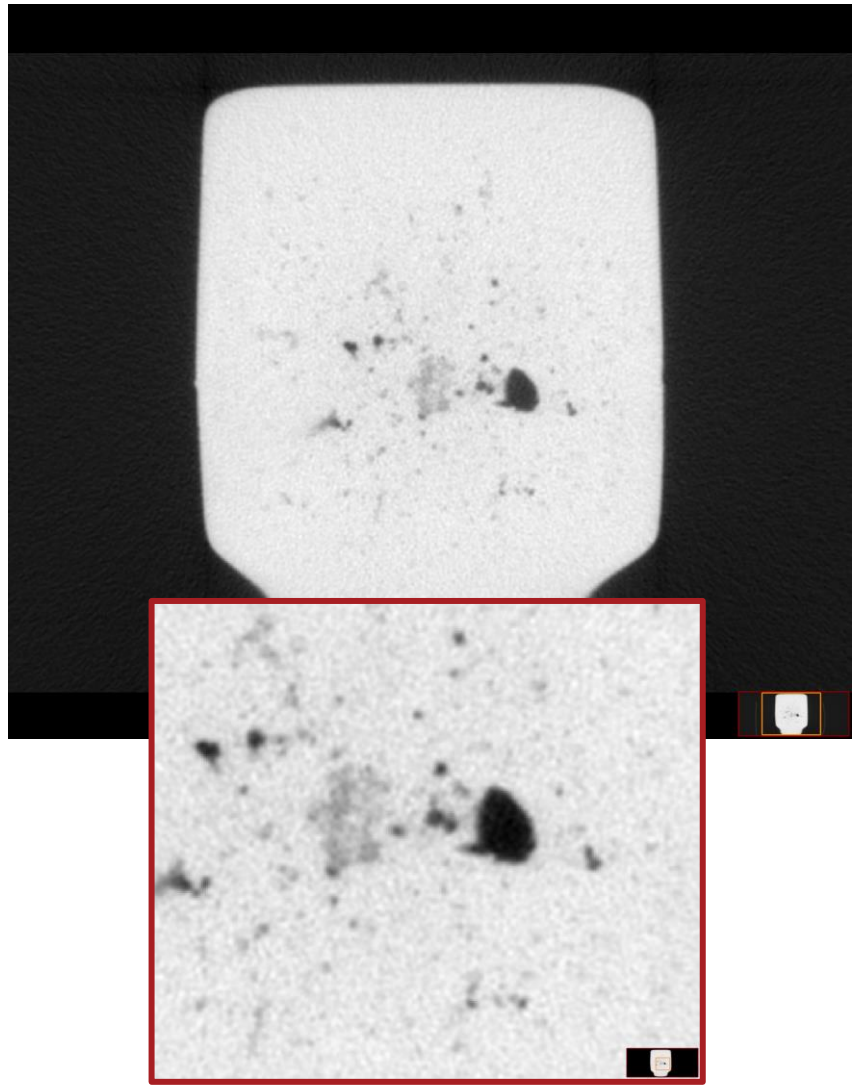
	SubpiX	2-Tile	1-Tile	Std. CT
Acquisition Time	97 mins	50 mins	27 mins	27 mins
Radiograph File Size	52.8 GB	26.4 GB	13.2 GB	13.2 GB

NORTH STAR IMAGING

Application: Metal Castings

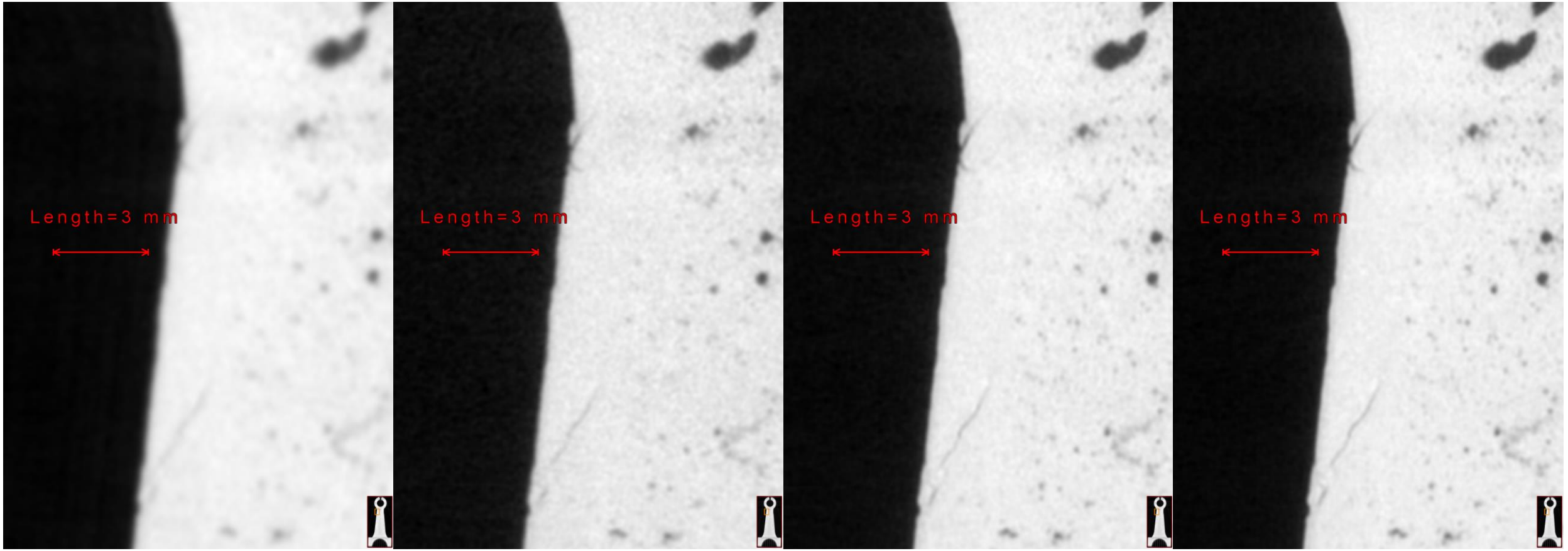
Standard Circular





1-Tile Accelerated SubpiX

Application: Metal Castings



Standard CT
27 mins

1-Tile
27 mins

2-Tile
50 mins

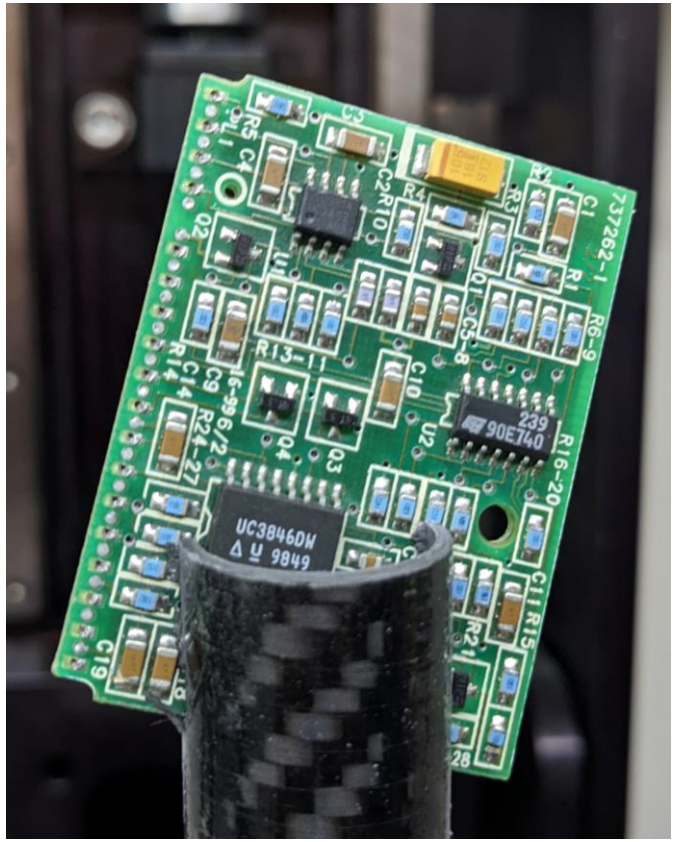
4-Tile
97 mins

NORTH STAR IMAGING

Application: Electronics

- Part: Printed circuit board (PCB)
- Source: Microfocus, 200 kV, 100 µA
- Detector: 3 FPS, 4 Fr. Avg.
    - Pitch: 127 µm
- Magnification: 3.18x

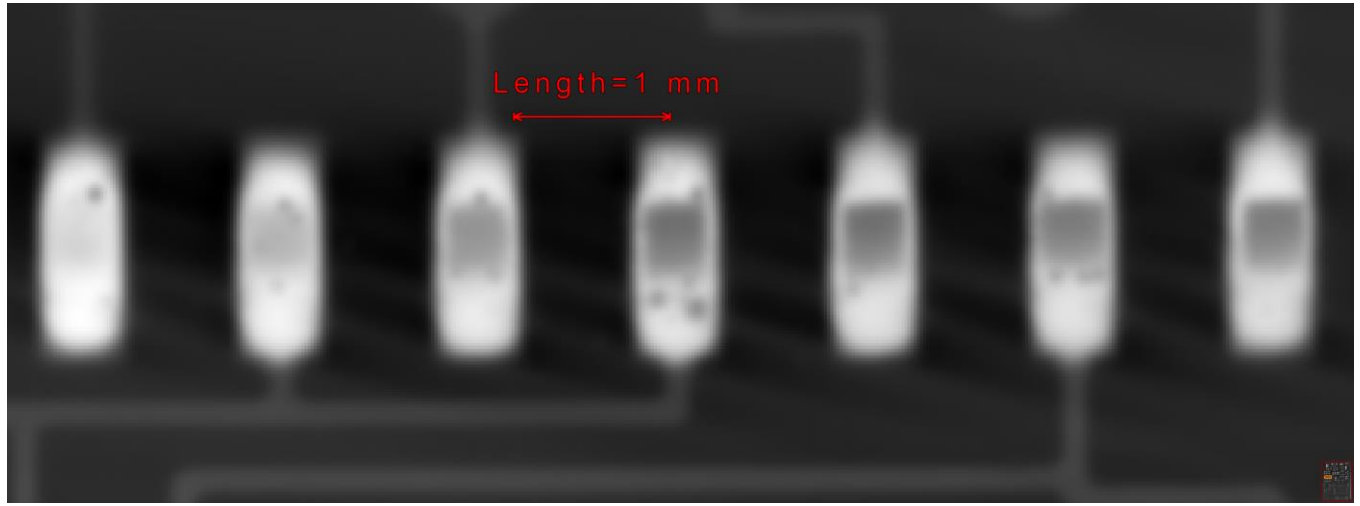
	SubpiX	2-Tile	1-Tile	Std. CT
Acquisition Time	211 mins	110 mins	60 mins	59 mins
Radiograph File Size	75.2 GB	37.6 GB	18.8 GB	18.8 GB



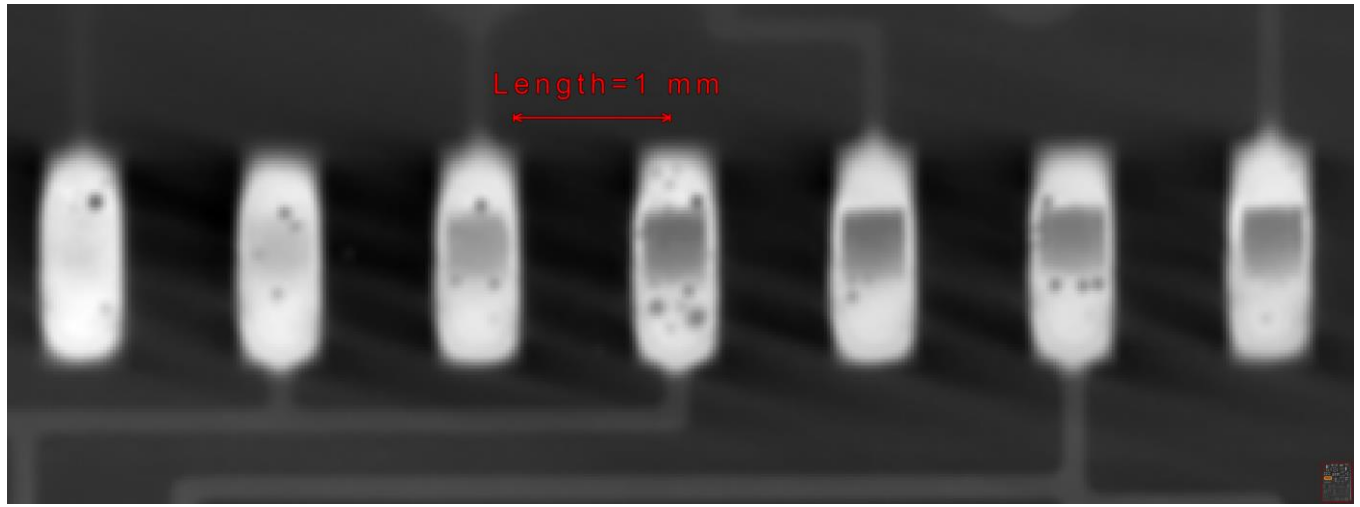
NORTH STAR IMAGING

Accelerated SubpiX - PCB

IC Soldering



Standard CT



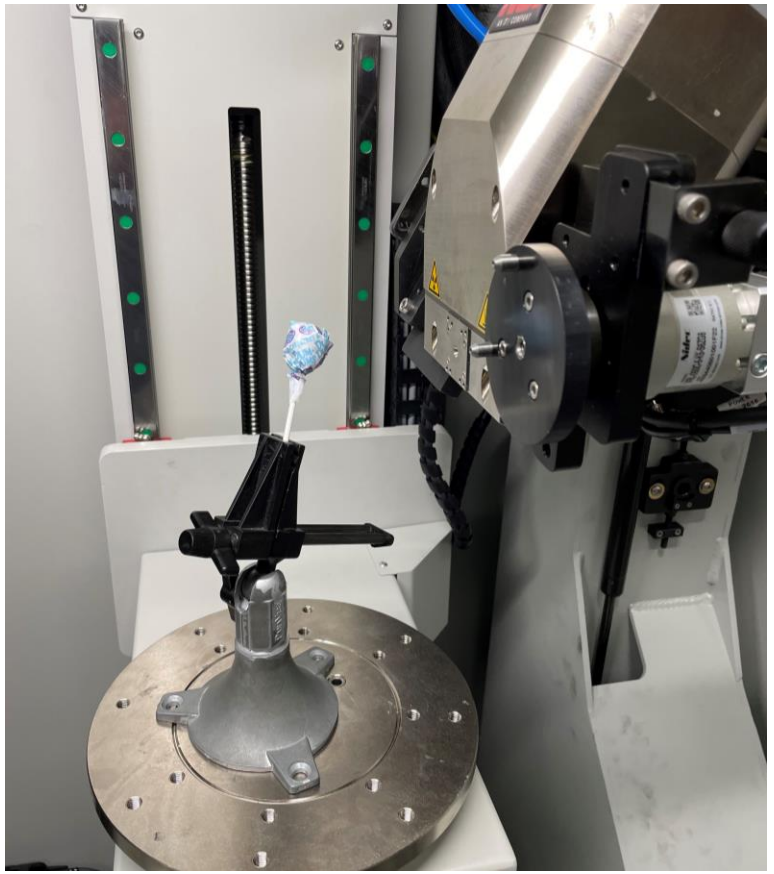
1-Tile

NORTH STAR IMAGING

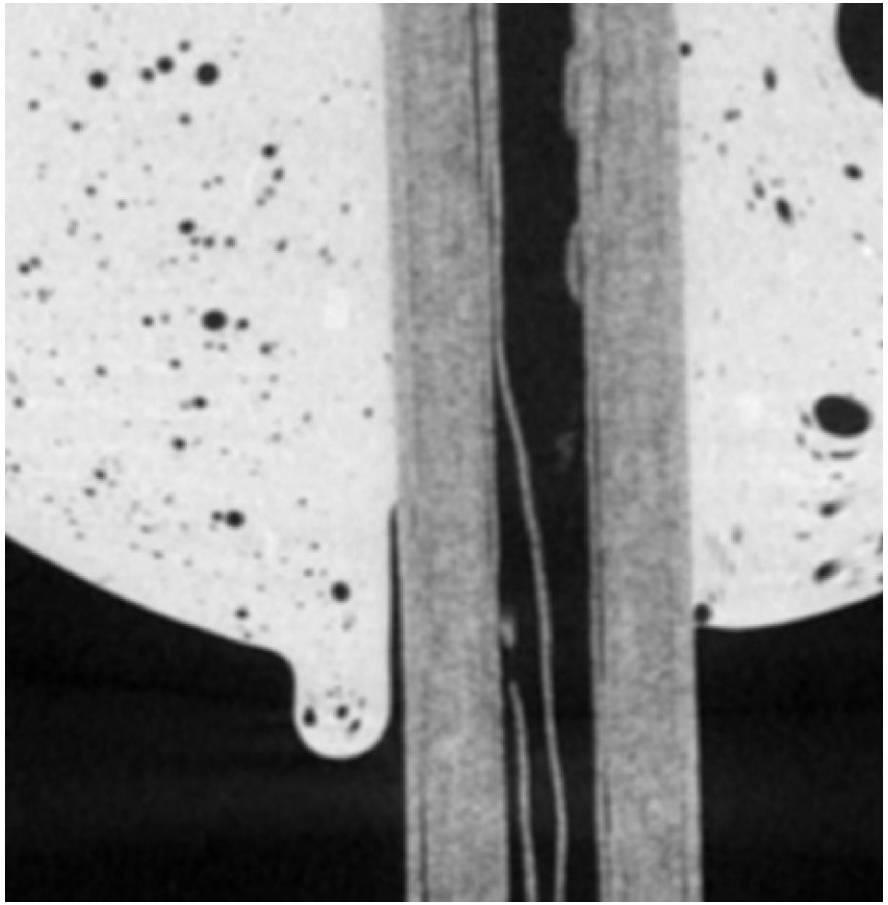
Application: Lollipop

- Source: Microfocus, 100 kV, 330 µA
- Detector: 28.04 FPS, 20 Fr. Avg.
  - Pitch: Binned 2x2 -> 300 µm
- Magnification: 7.22x

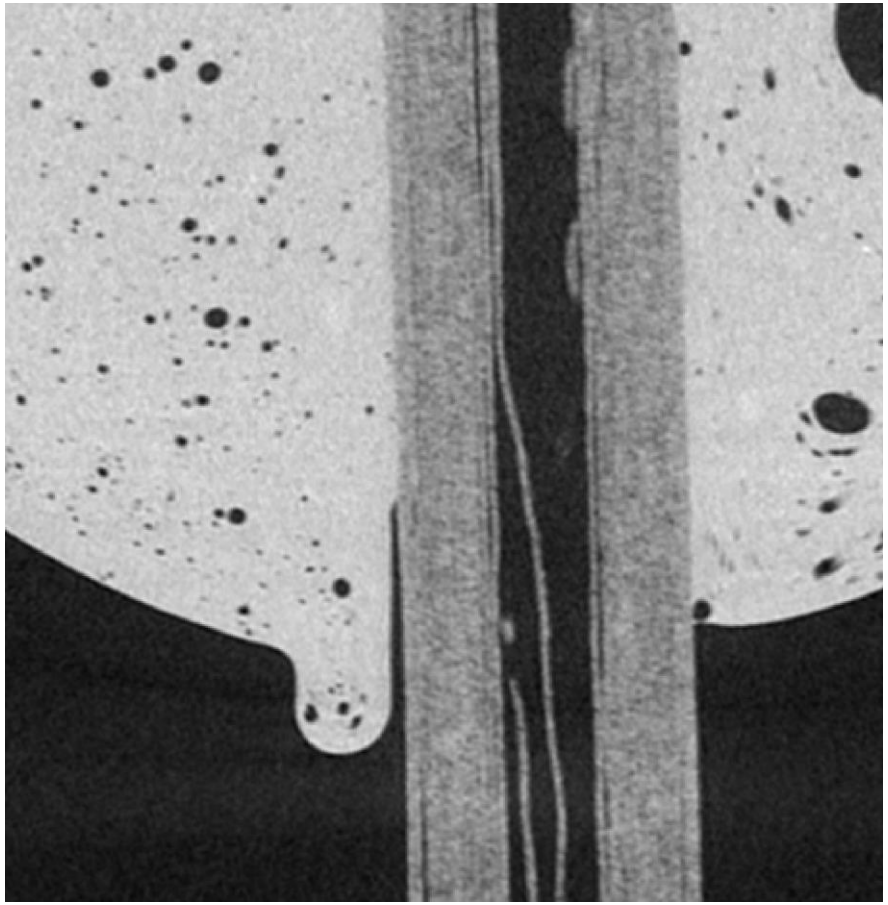
	SubpiX	2-Tile	1-Tile	Std. CT
Acquisition Time	124 mins	60 mins	33 mins	
Radiograph File Size	44.4 GB	22.2 GB	11.1 GB	11.1 GB



Accelerated SubpiX - Lollipop

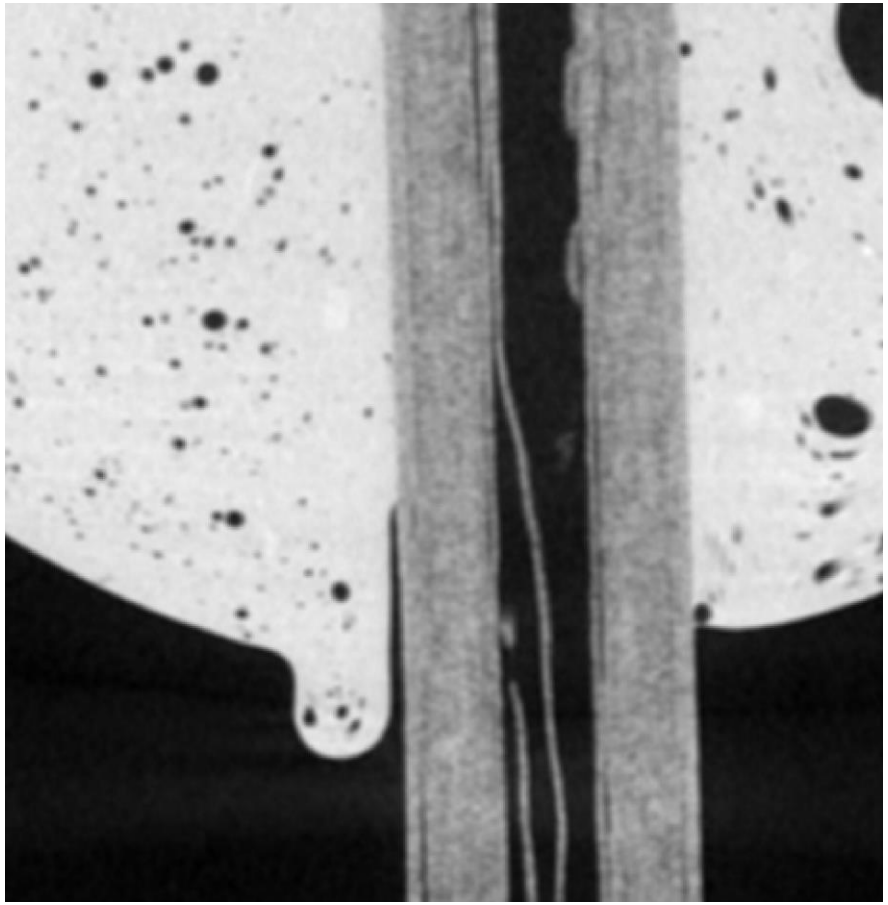


Standard CT

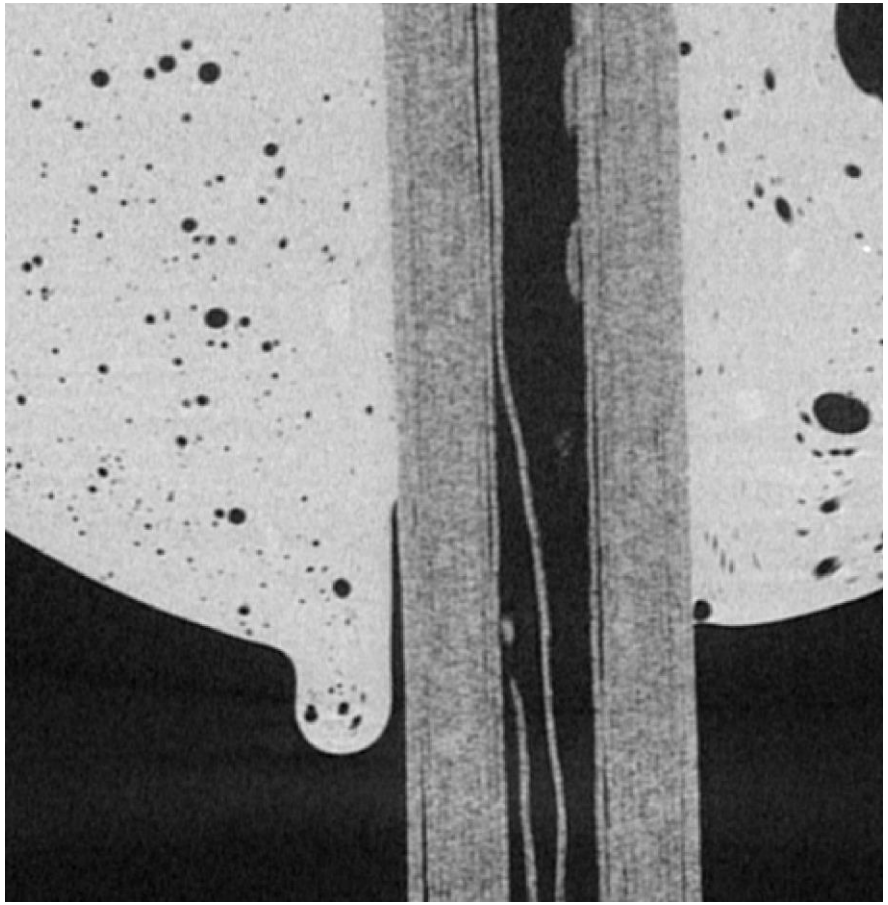


1-Tile

Accelerated SubpiX - Lollipop



Standard CT

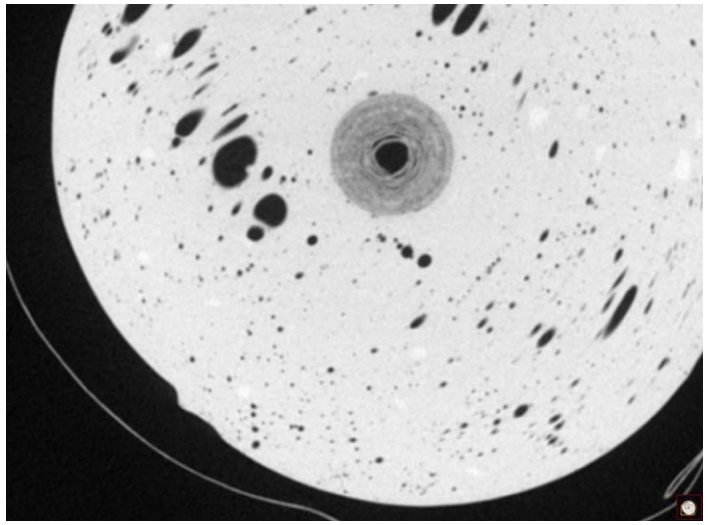


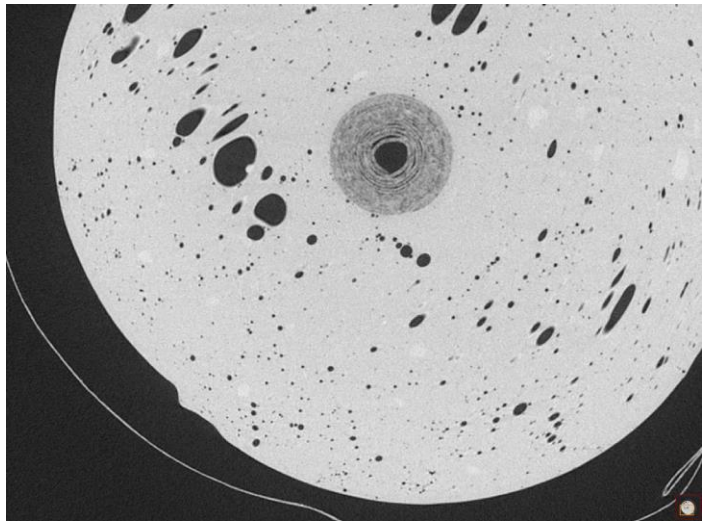
2-Tile

NORTH STAR IMAGING

Accelerated SubpiX - Lollipop

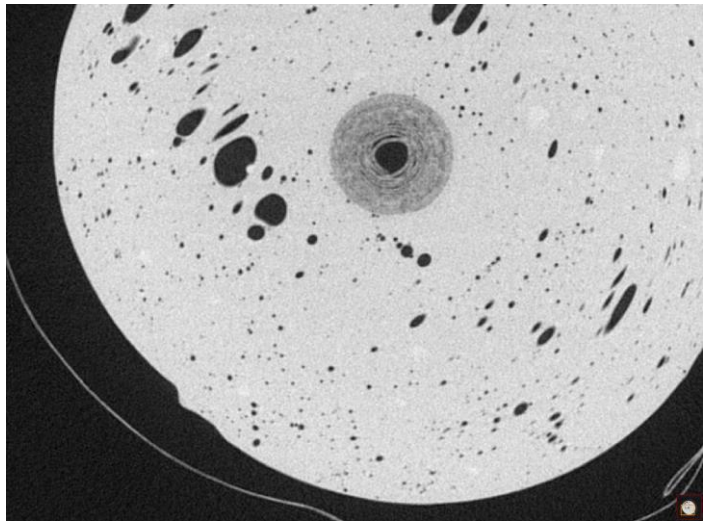
Standard CT

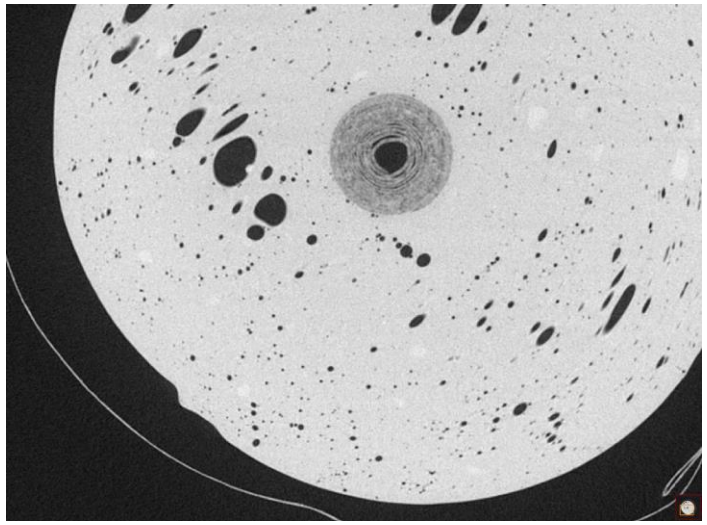




Standard SubpiX

1-Tile





2-Tile

NORTH STAR IMAGING

Conclusion

- SubpiX is a method that improves CT resolution
- Introduced new Accelerated SubpiX
  - 2-Tile
    - 2x faster than 4-Tile SubpiX
    - Slightly lower quality than 4-Tile
  - 1-Tile
    - 4x faster than 4-Tile, same time as Standard CT
    - Resolution improvement over Standard CT

NORTH STAR IMAGING