

# Zeiss Xradia 610 Versa

## 3D X-ray imaging of a 3-strand rope

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### Working principle and schematic

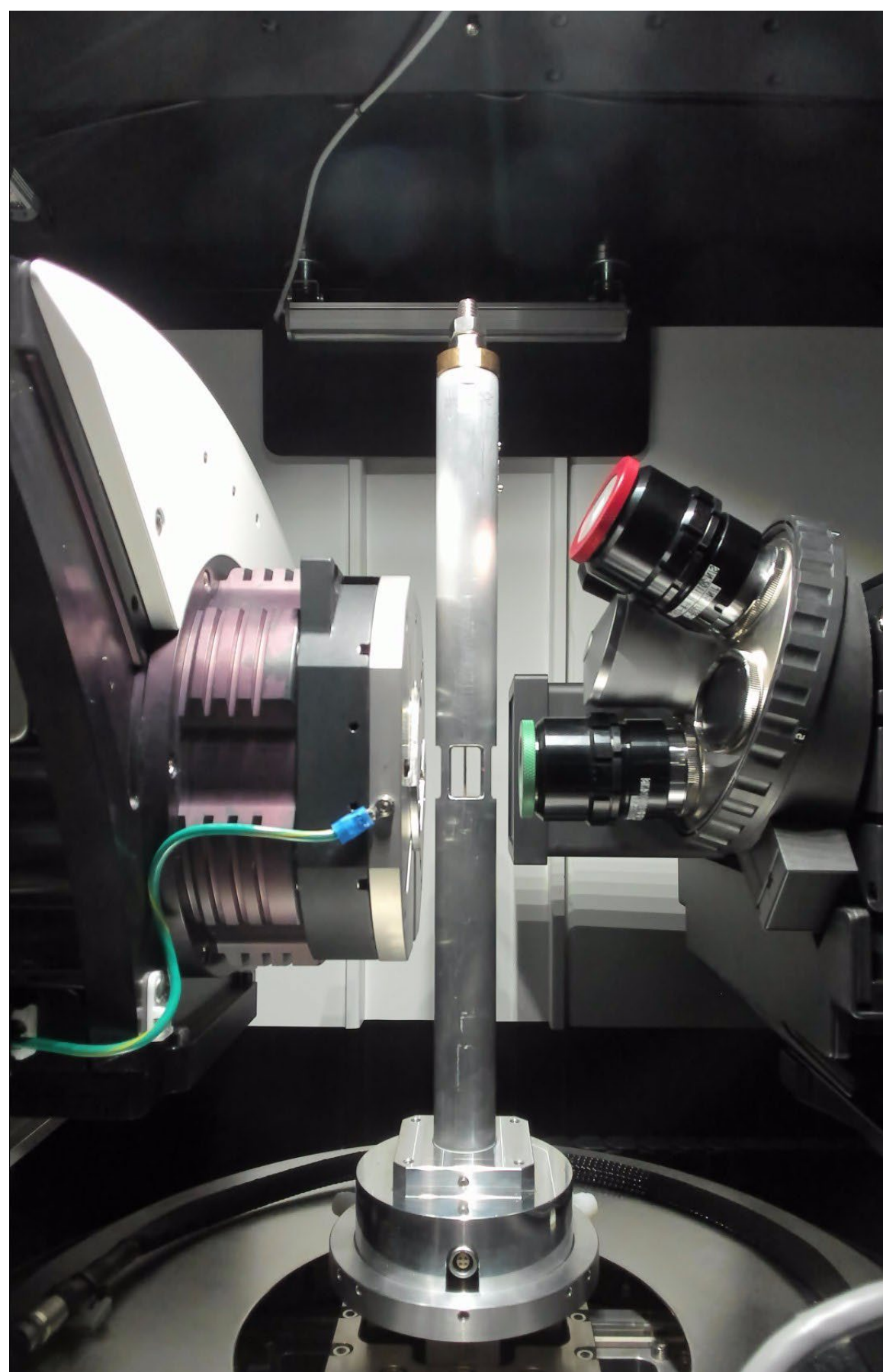


Figure 1. Custom tensile stage (2 kN) mounted in the CT scanner.

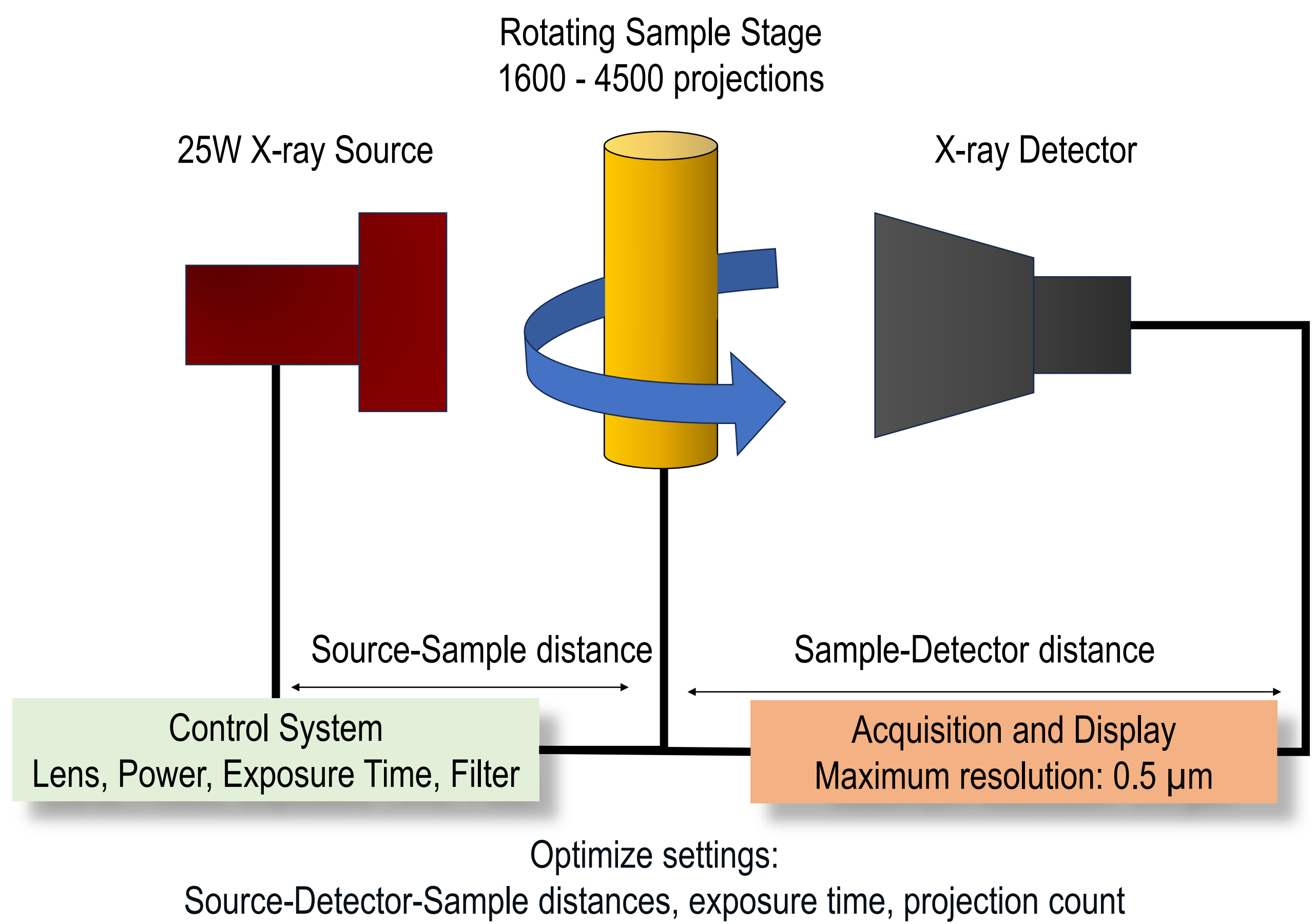
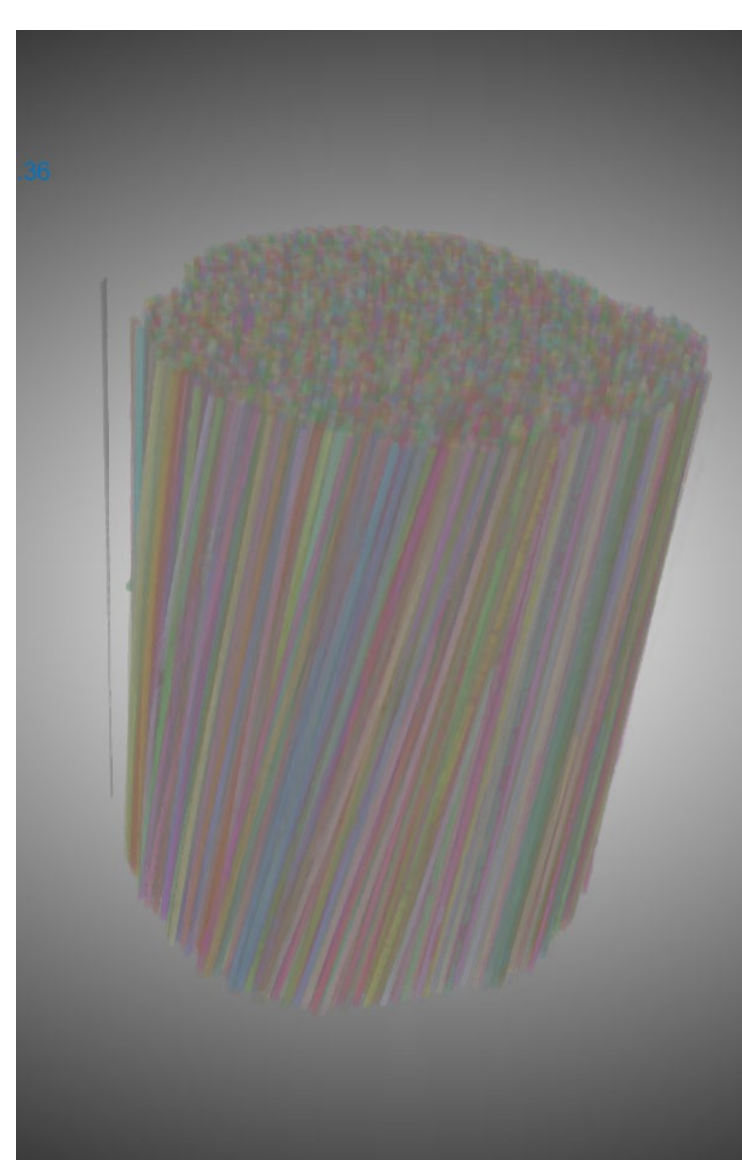


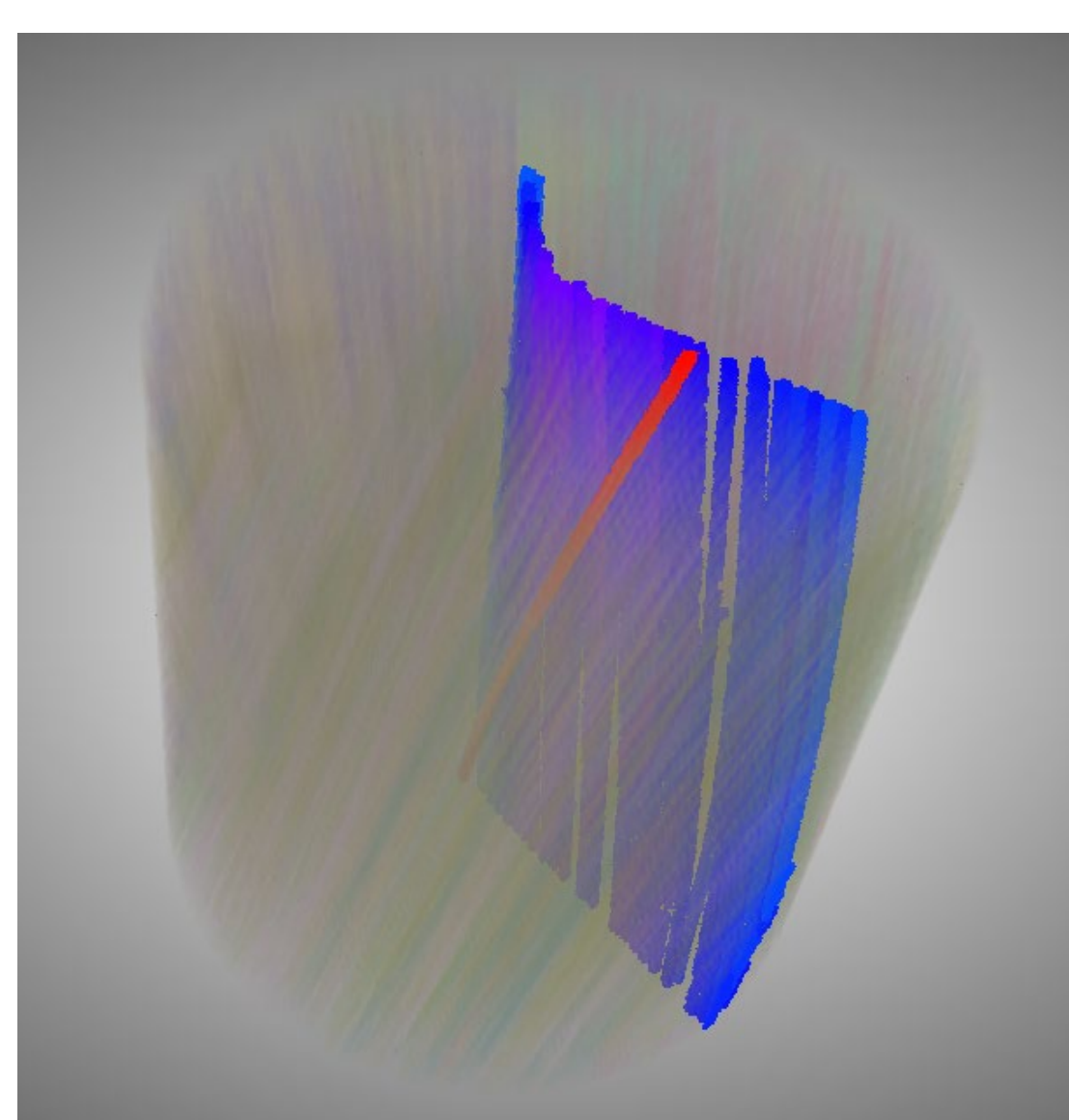
Figure 2. Schematic of working of the CT scanner.

### Results and discussion

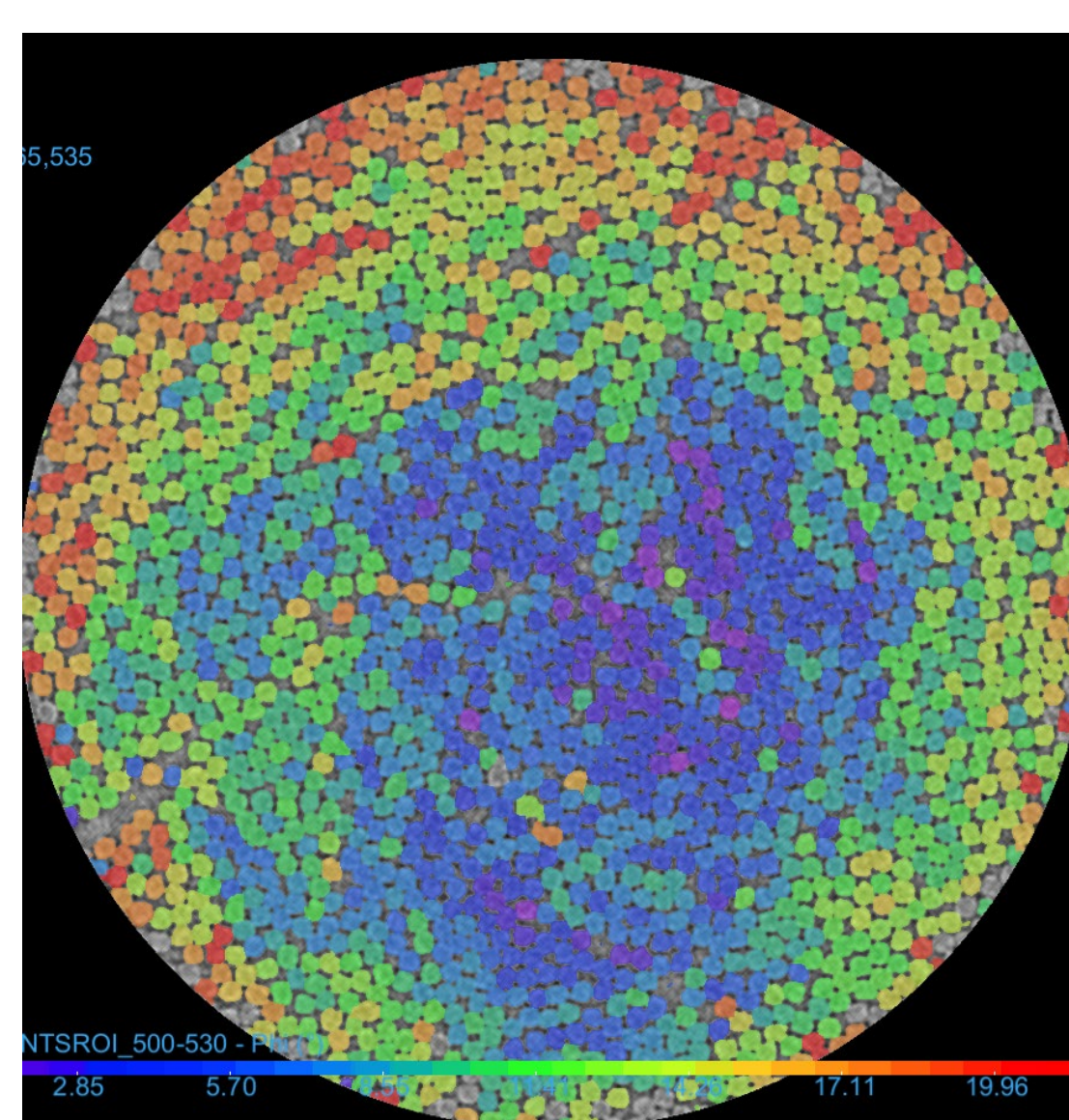
Dragonfly software processes micro-CT images of a rope, segmenting it into individual filaments for detailed analysis. By utilizing advanced algorithms, Dragonfly identifies each filament, despite their small diameter of 12.5 microns, allowing for precise measurements and examination of each filament's characteristics separately. This segmentation facilitates in-depth analysis of the rope's structure and properties at the micro-level.



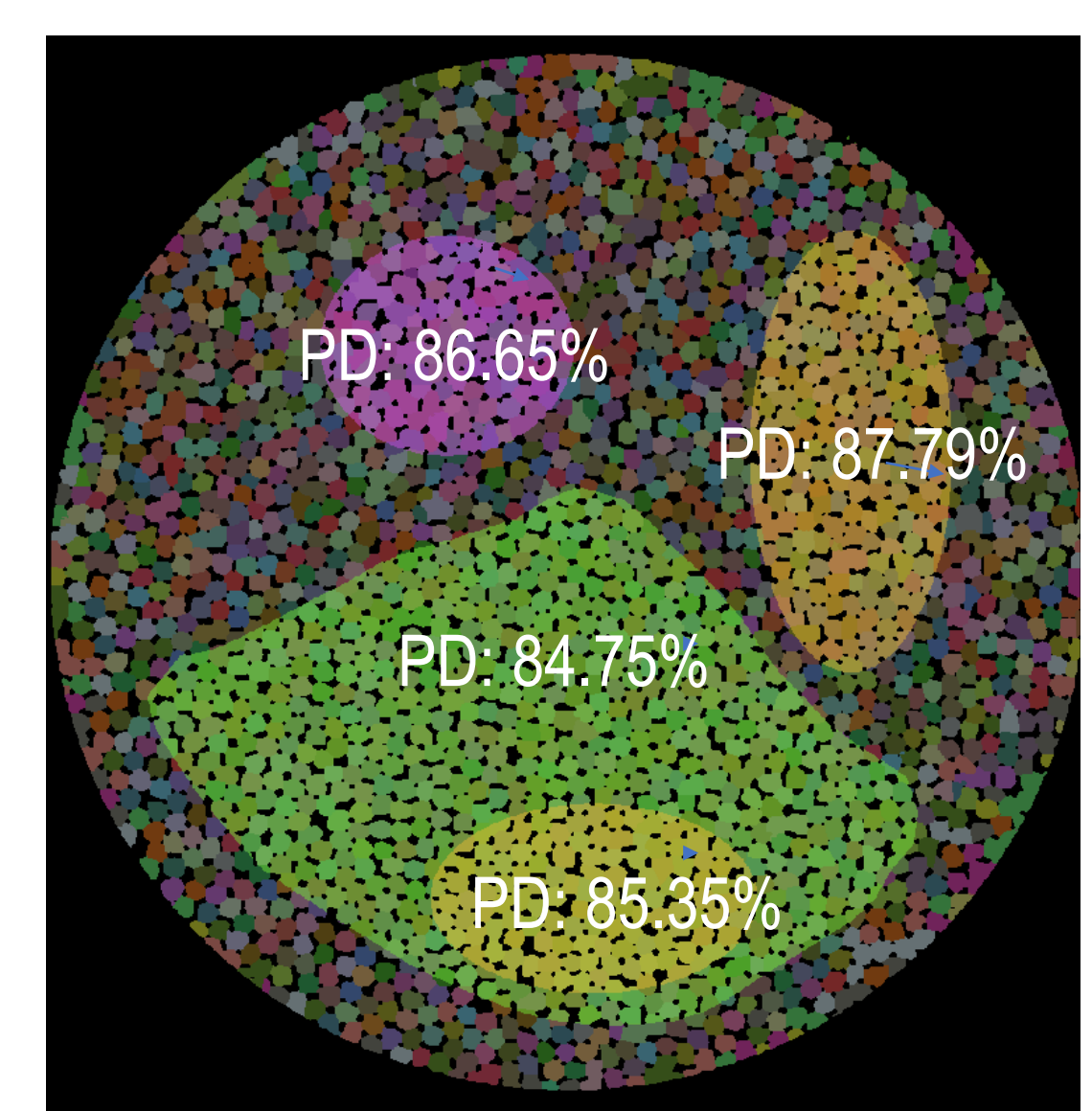
3D image of loaded 3-strand rope



Filaments at strand interface



Cross-section with helix angle  $\phi$  distribution



Filament packing density (PD) across rope regions

Figure 3. 3D X-ray imaging of a 3-strand rope, processed using dragonfly software.

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