

# **Tomography reconstruction of**

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## **1 Background**

## **2 Experiment**

## **3 Tomography reconstruction**

### **3.1 Data preprocessing**

#### **3.1.1 Background normalization**

#### **3.1.2 Data correction**

#### **3.1.3 Data reduction**

#### **3.1.4 Background normalization**

#### **3.1.5 Impulse noise reduction**

#### **3.1.6 Background level normalization**

## **4 Porosity characterization**

## **5 Summary**

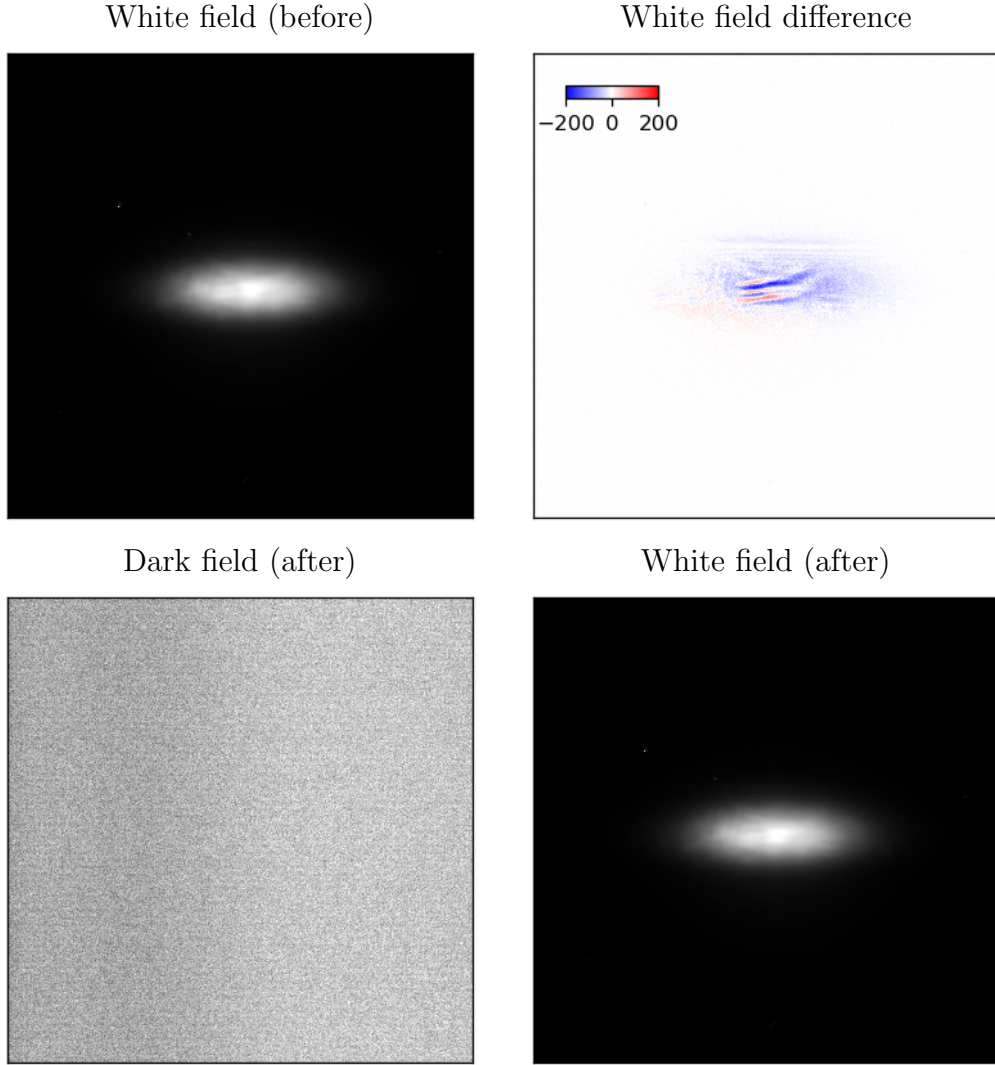


Figure 1: The median of background (white and dark) images collected before and after the tomography scan. The dynamic range of the white field images are  $[0, 4000]$  (counts) while the dynamic range of the dark field image is  $[0, 10]$  (counts).

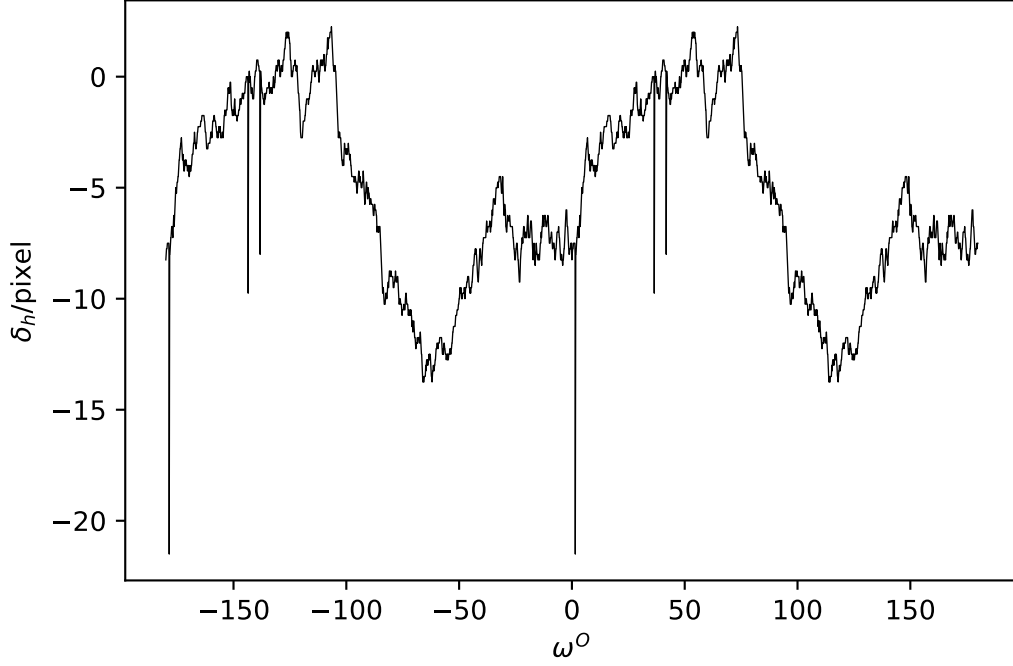


Figure 2: The corrupted frames can be detected by checking the outliers in the profile of  $180^\circ$  pair-wise rotation axis where  $\delta_h$  denotes the amount of horizontal offset between rotation axis and the image center column.

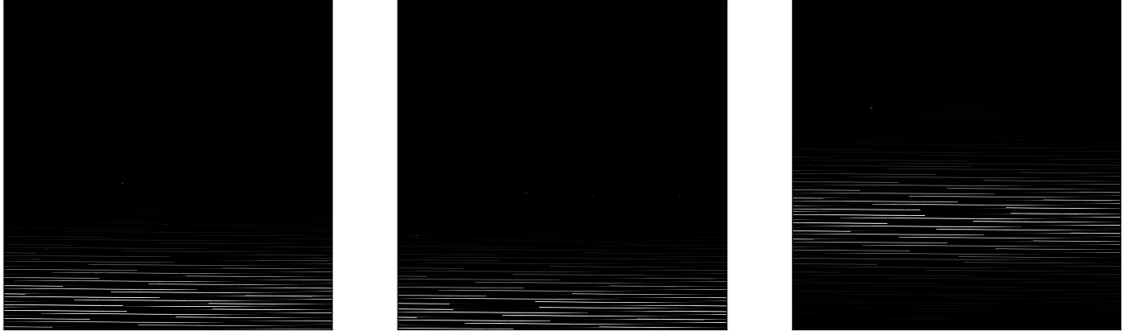


Figure 3: Three corrupted frames were detected out of the total 3600 frames. Due to the horizontal detector jittering, these corrupted frames and the associated  $180^\circ$  pairs were excluded from the tomography reconstruction as it is not possible to adjust a  $180^\circ$  pair horizontally with one corrupted frame.

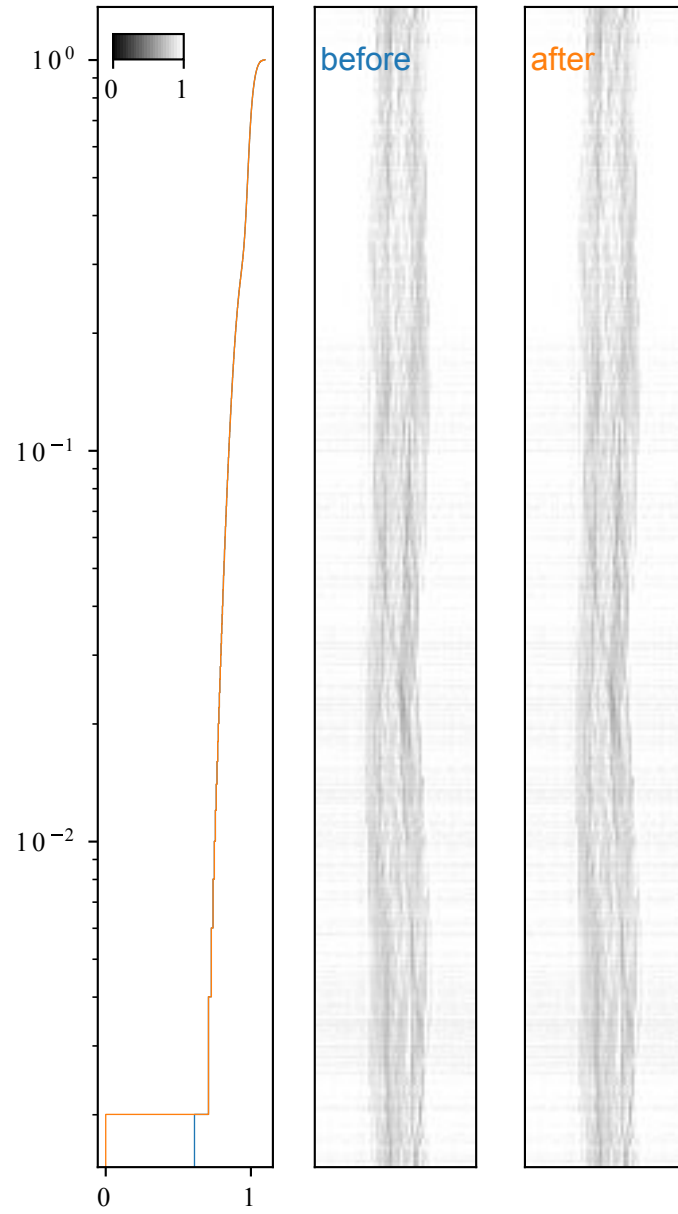


Figure 4: Remove impulse noise from sinogram using selective median filter.

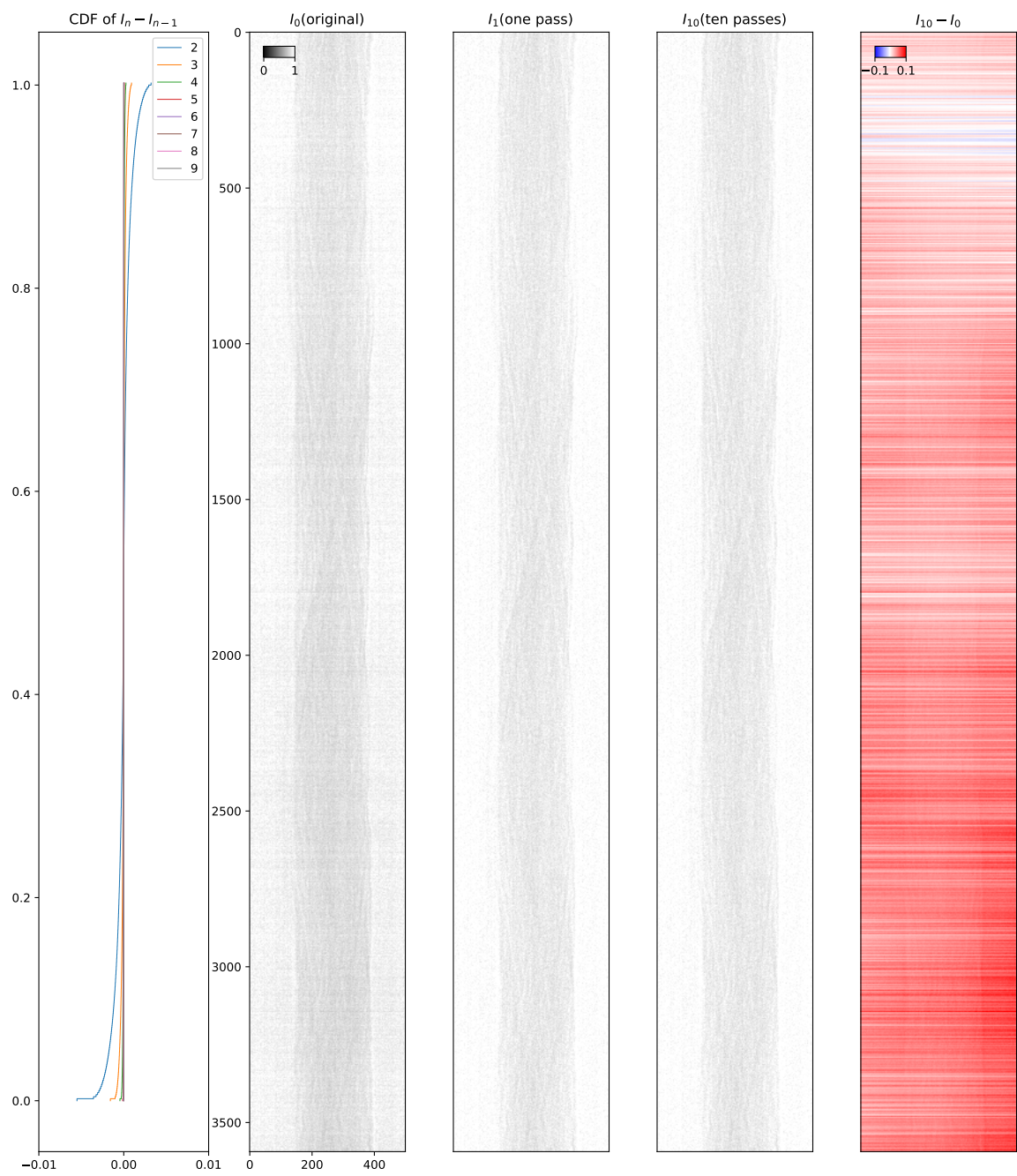


Figure 5: Top region

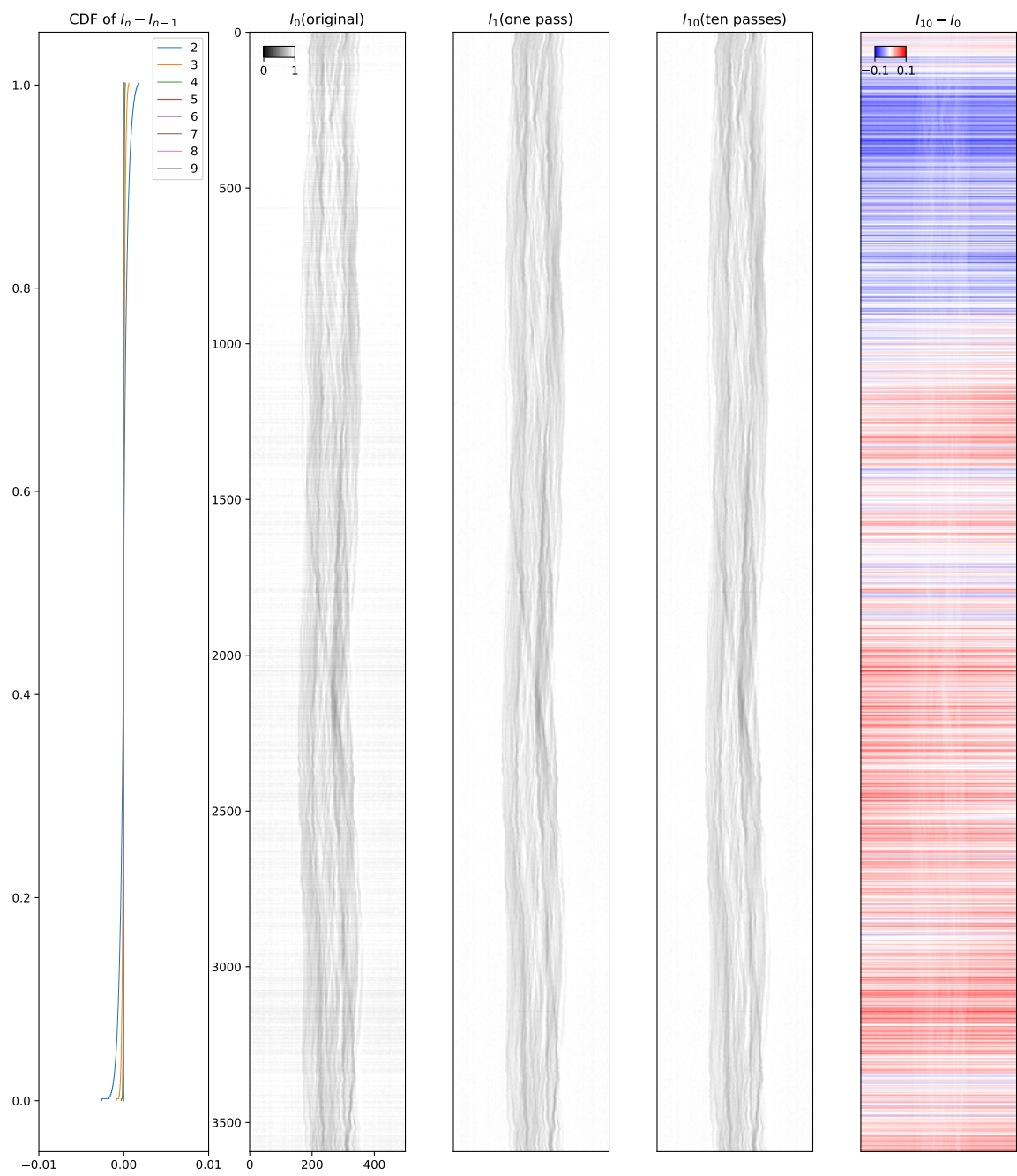


Figure 6: Middle region

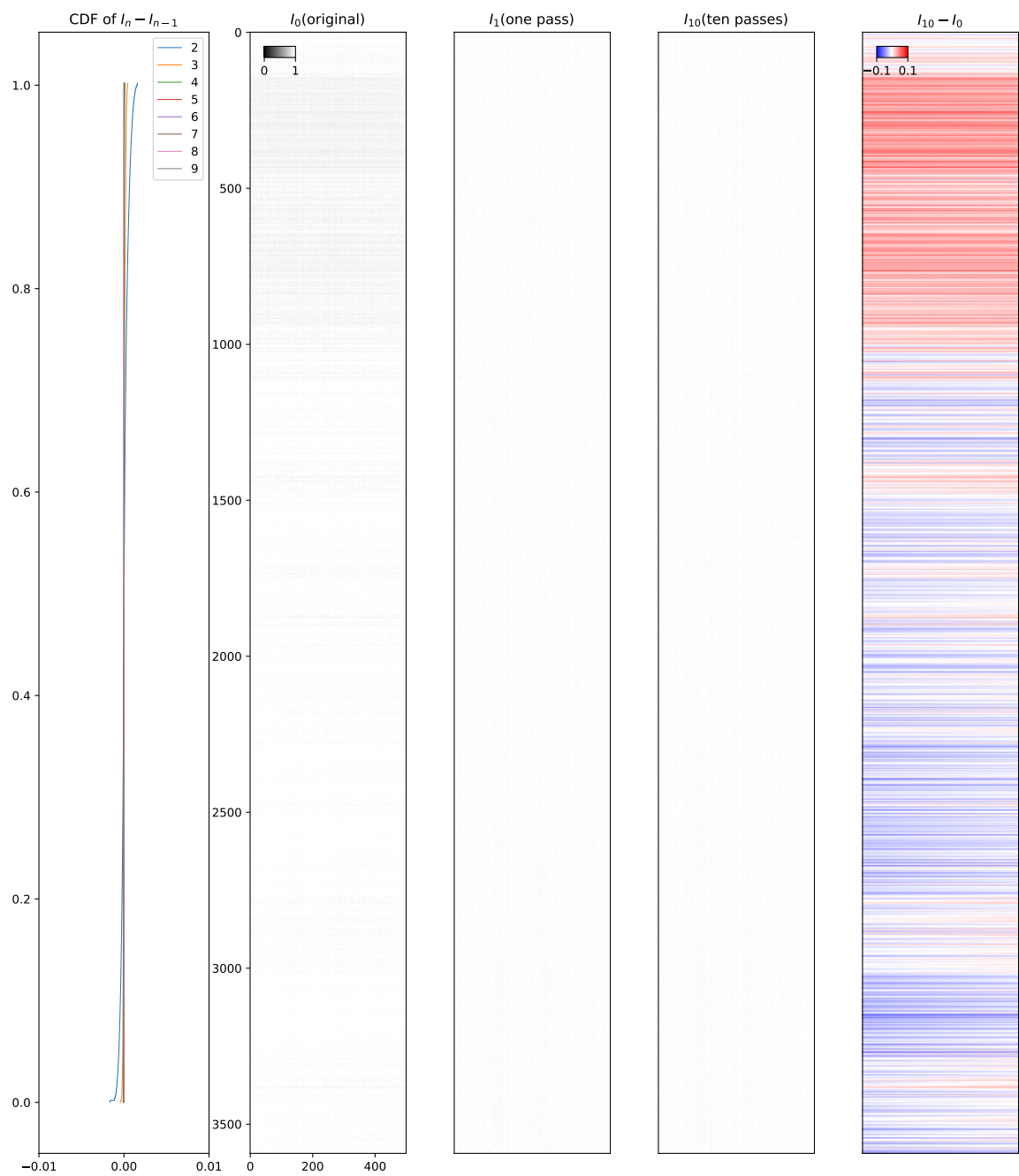


Figure 7: Bottom region

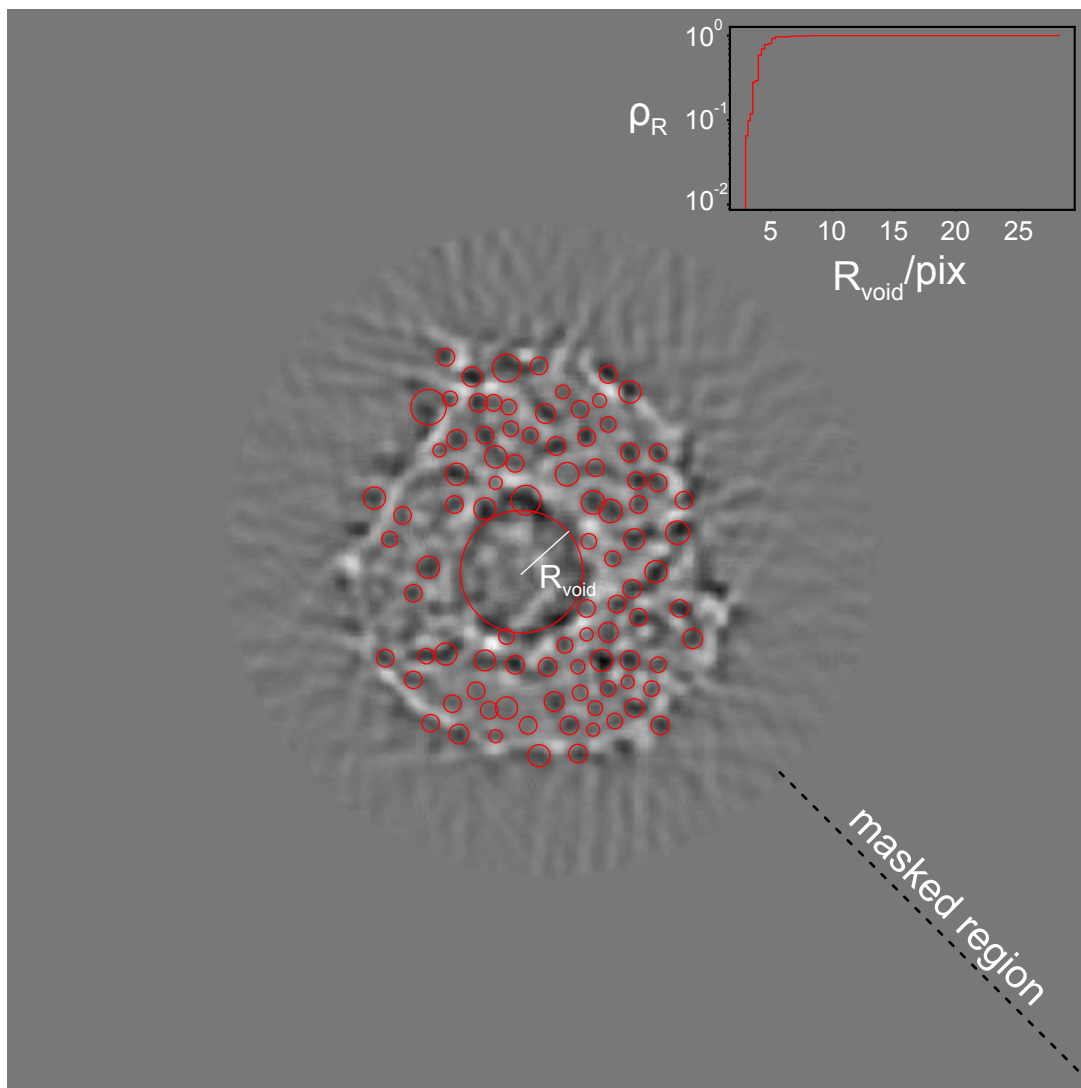


Figure 8: void detection demo



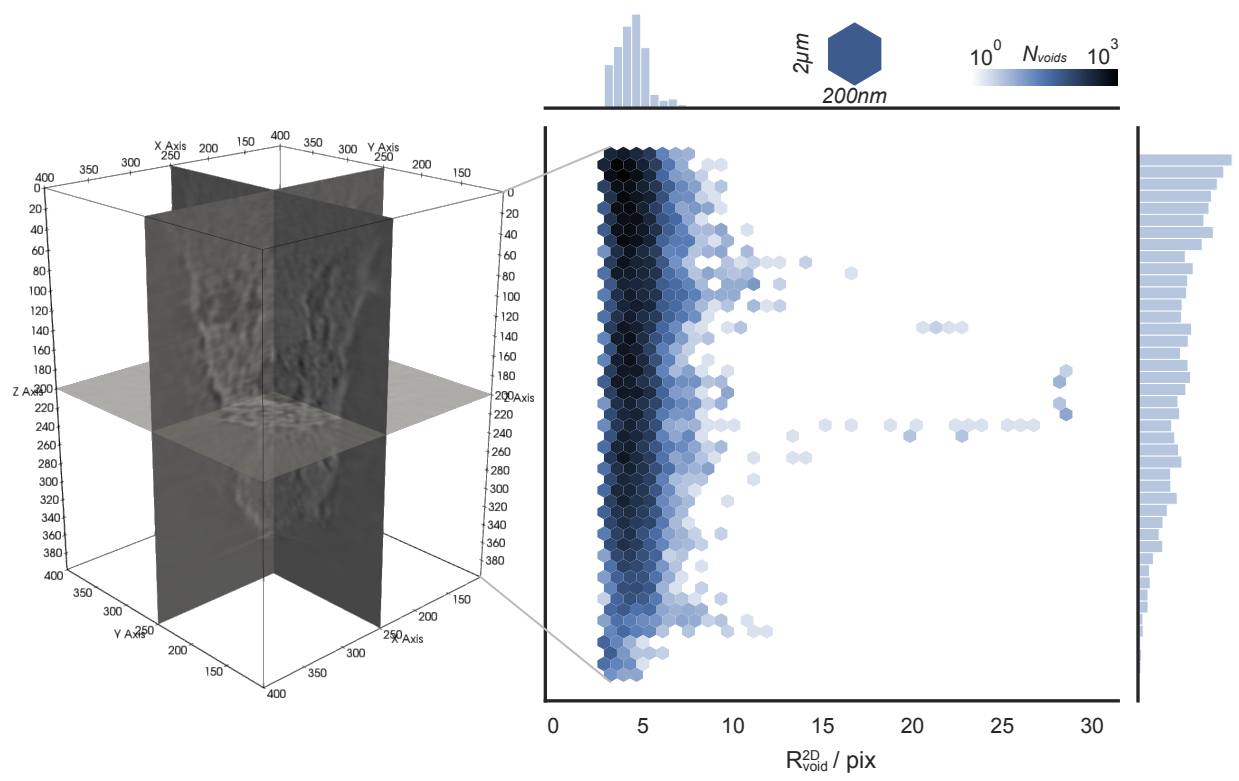


Figure 9: void profile