

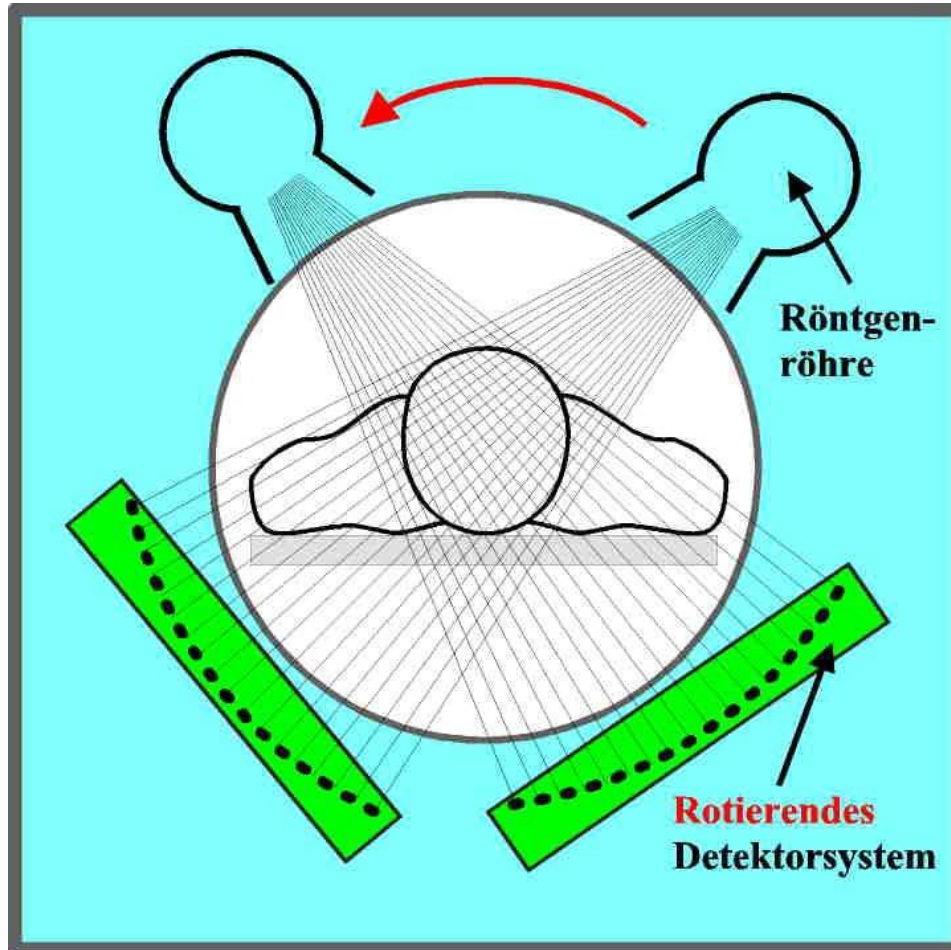
# From teeth to scrolls to film

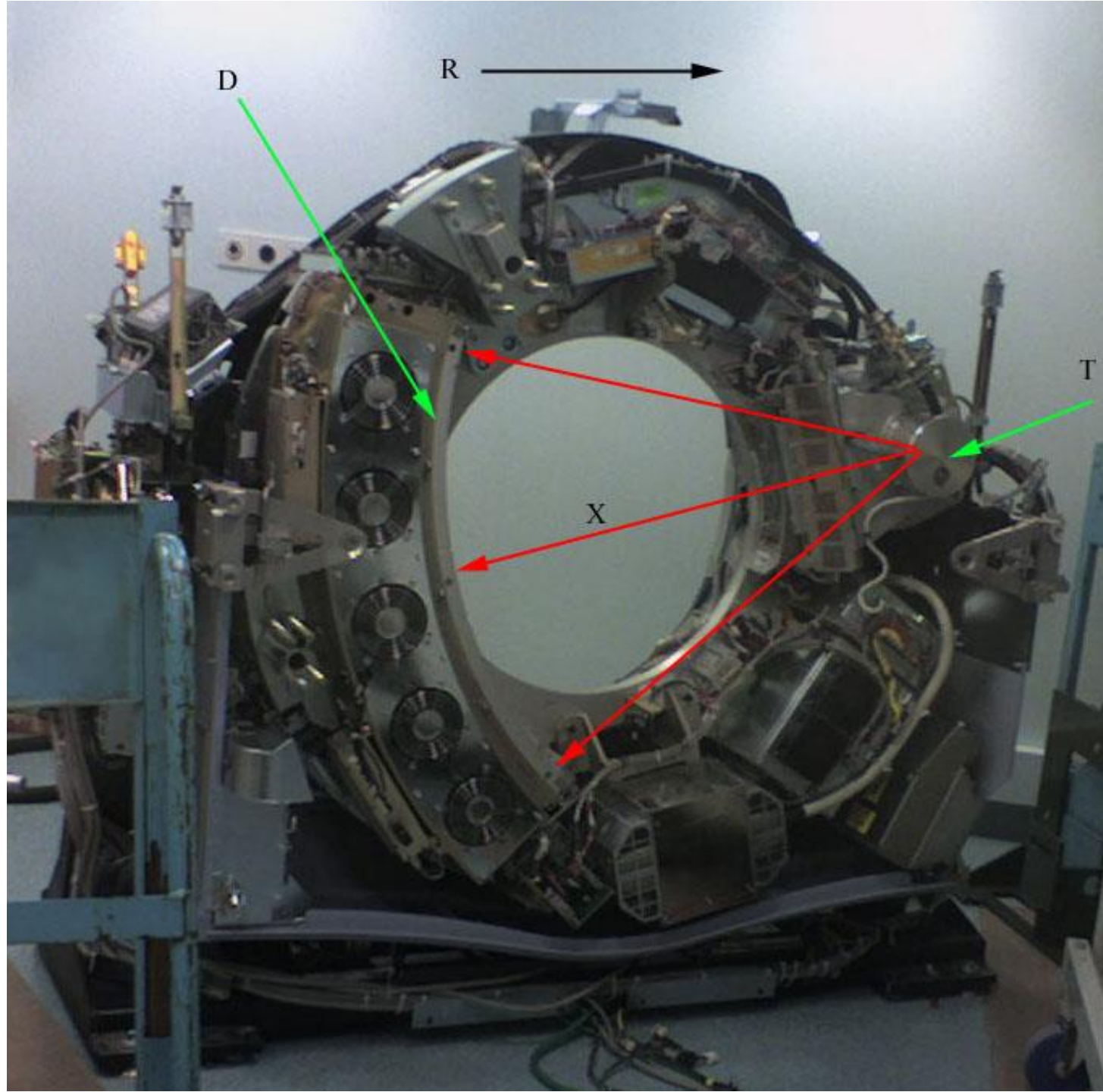
Graham Davis

# Medical Computed Tomography

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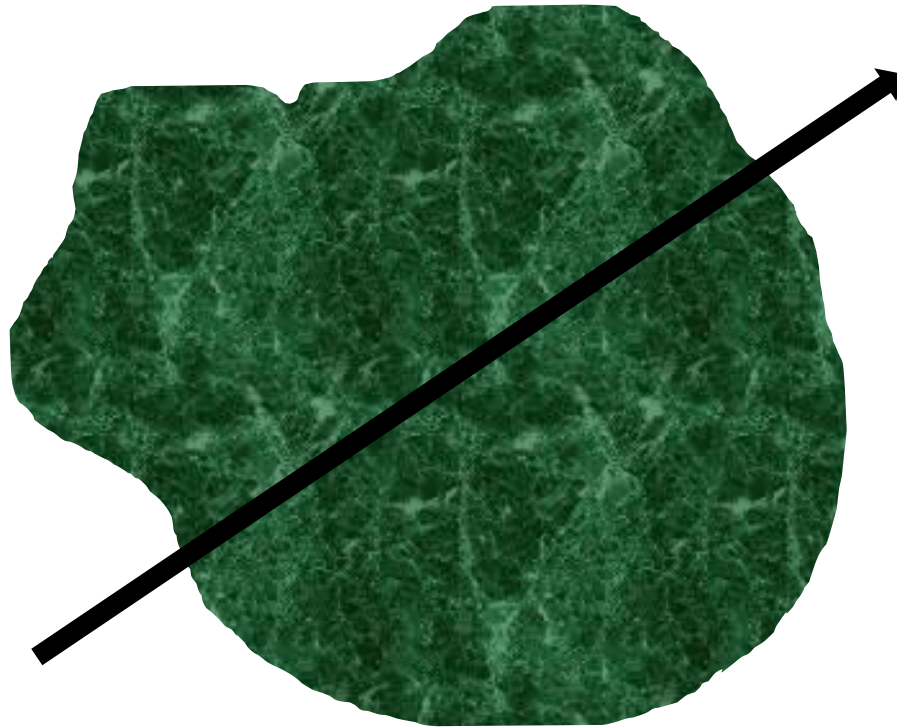




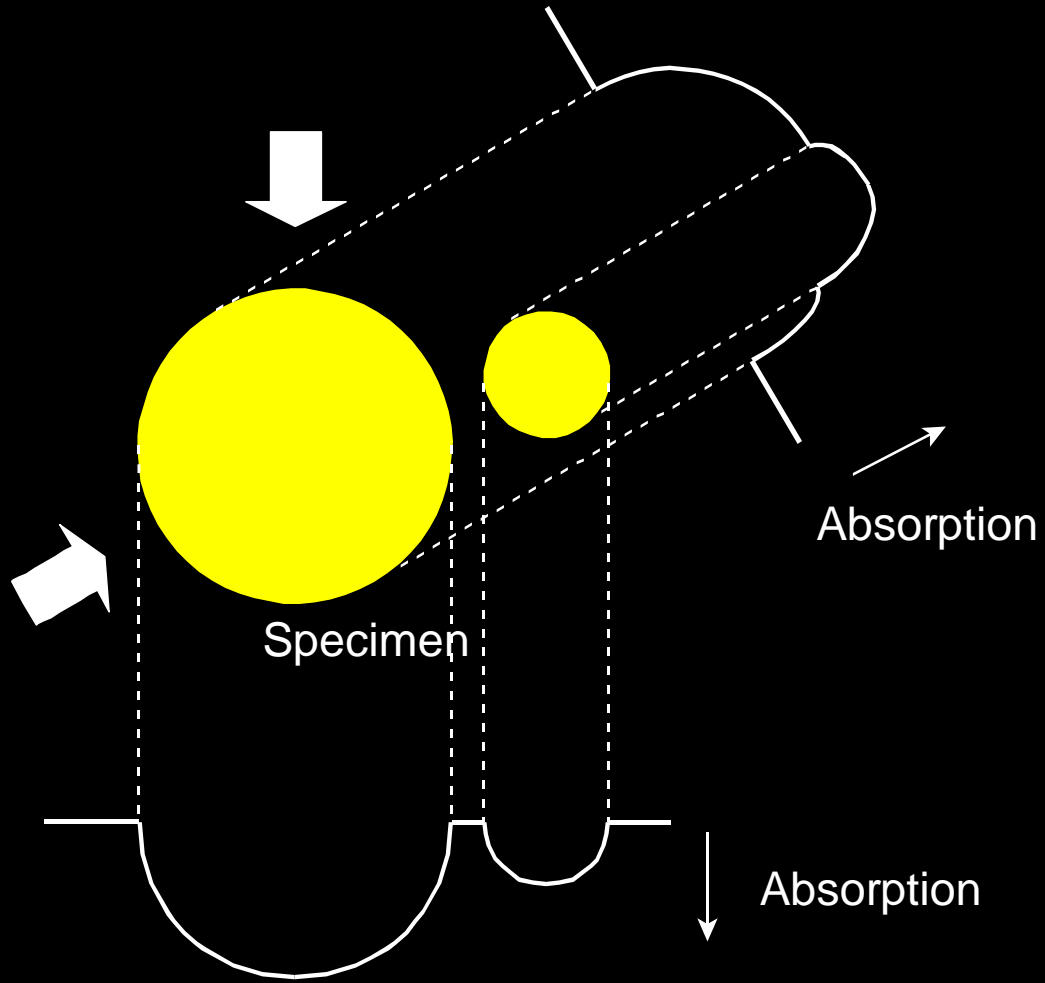




# Line Integral Principle



$$\textit{Attenuation} = \log \frac{I_0}{I}$$



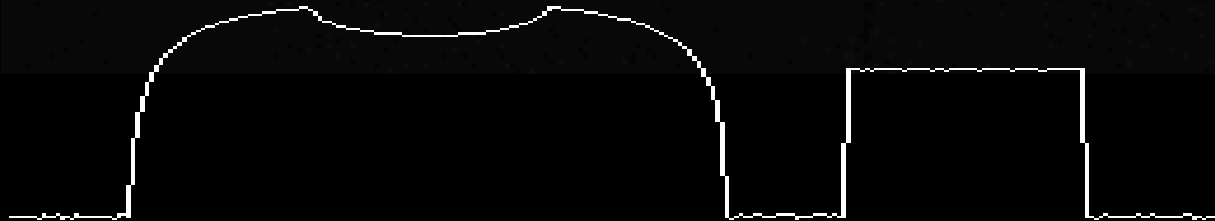
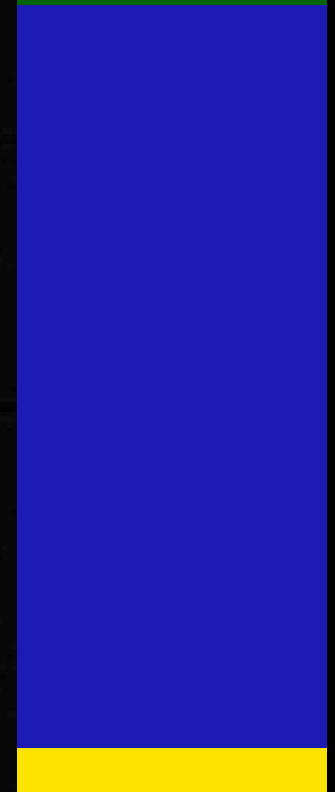




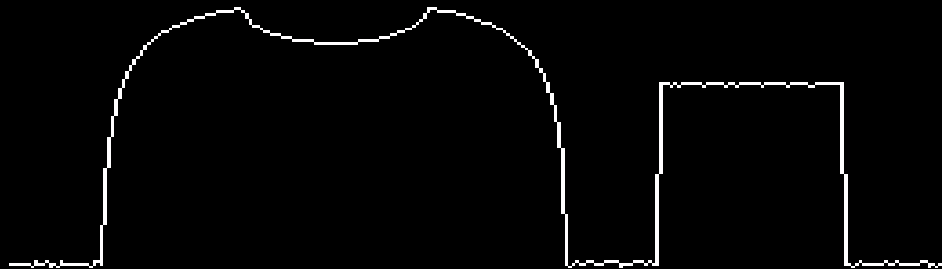
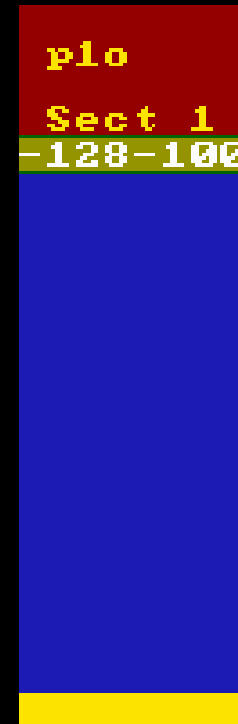
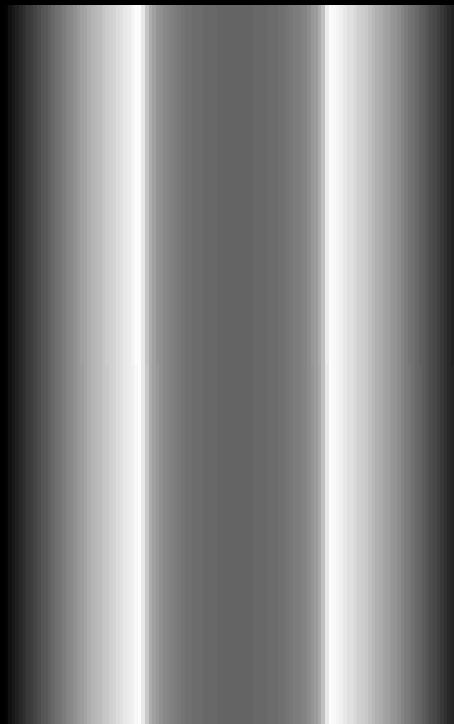
# Single Projection



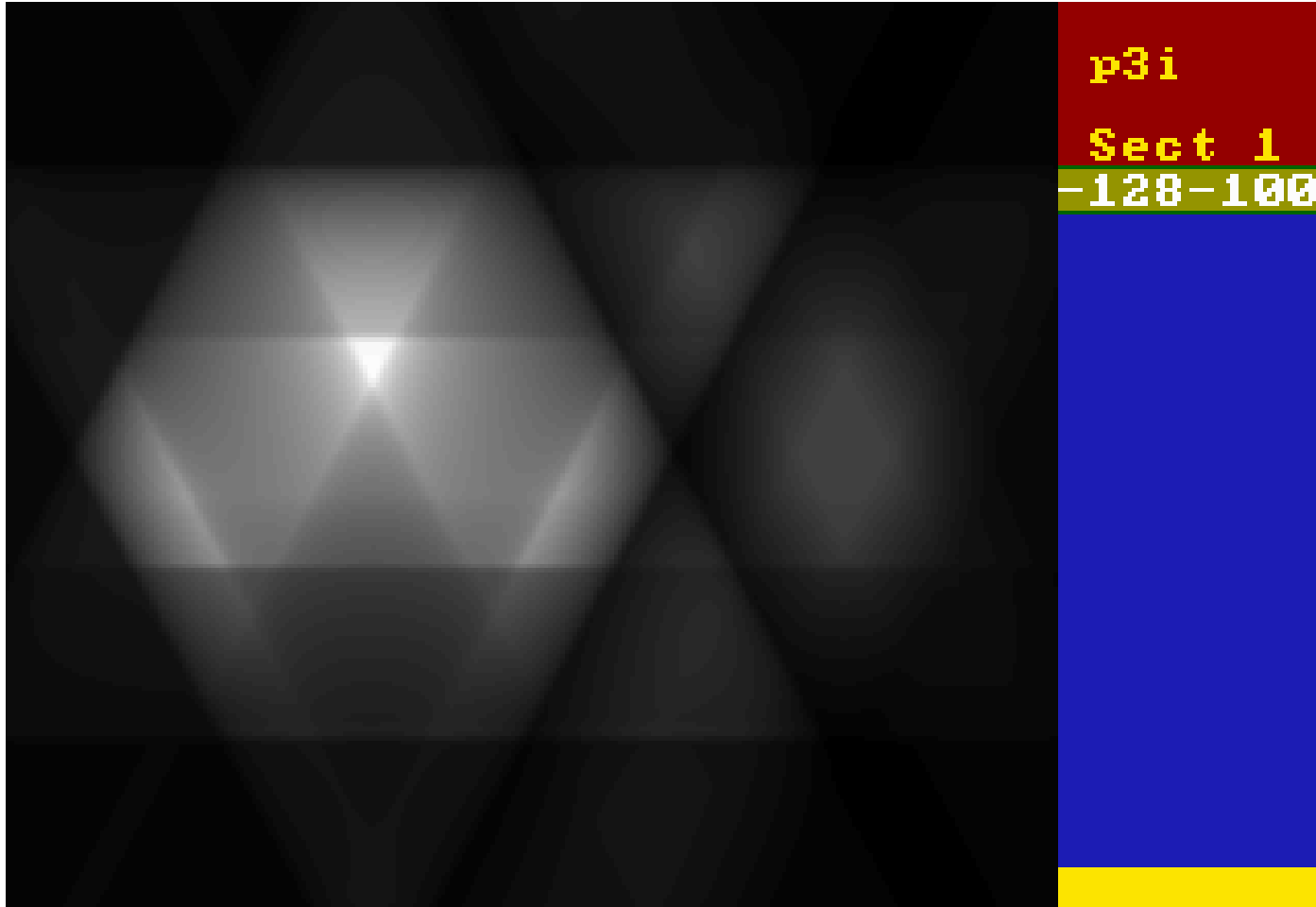
p243  
Sect 1  
-128 58



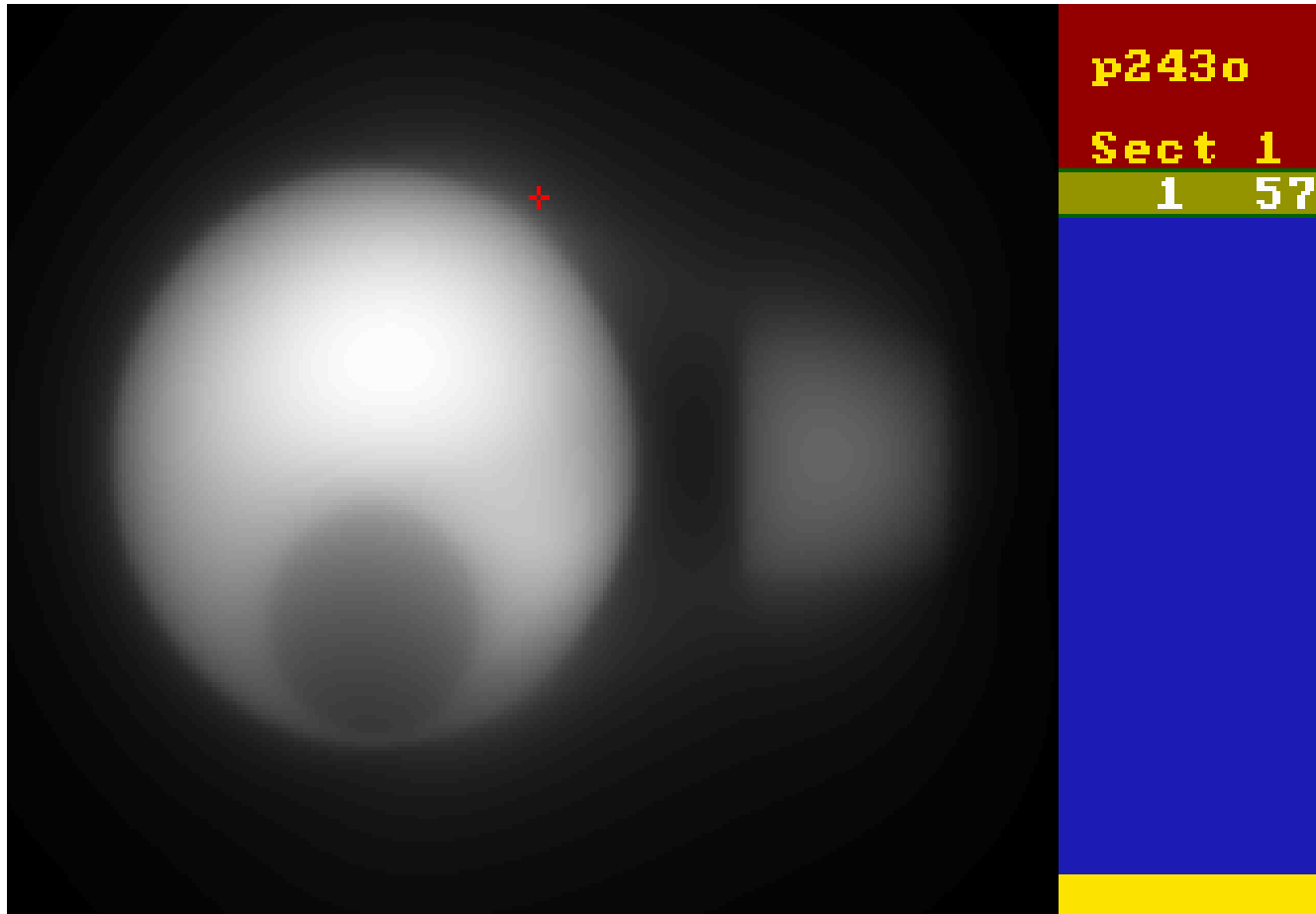
# Back Projection



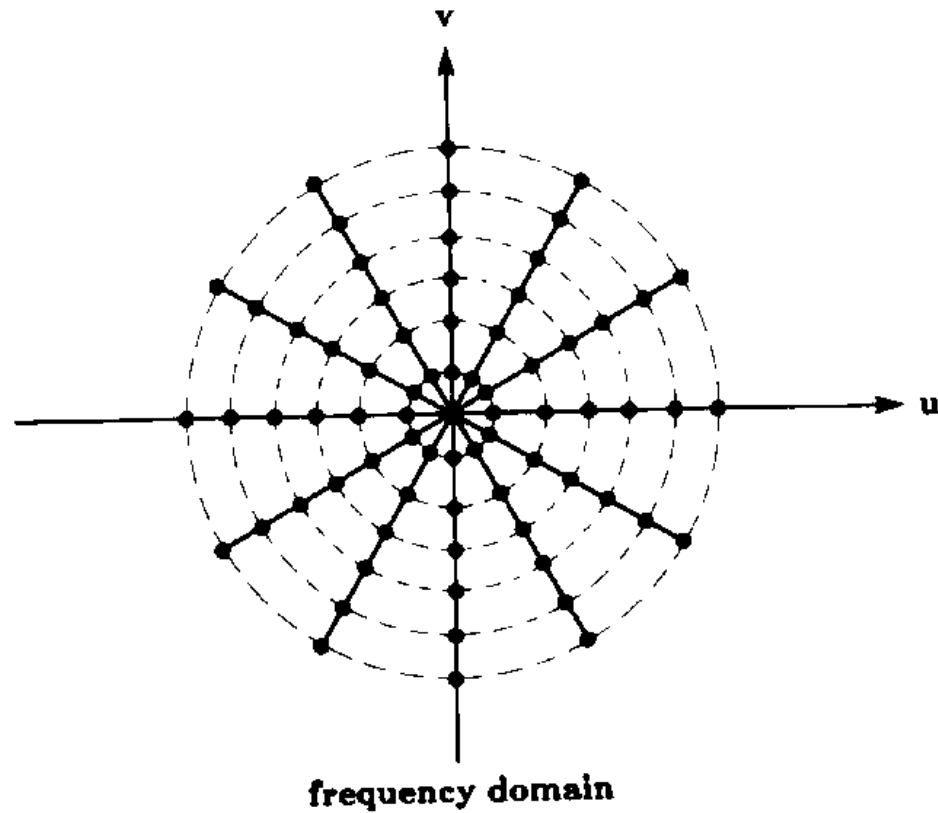
# 3 Projections



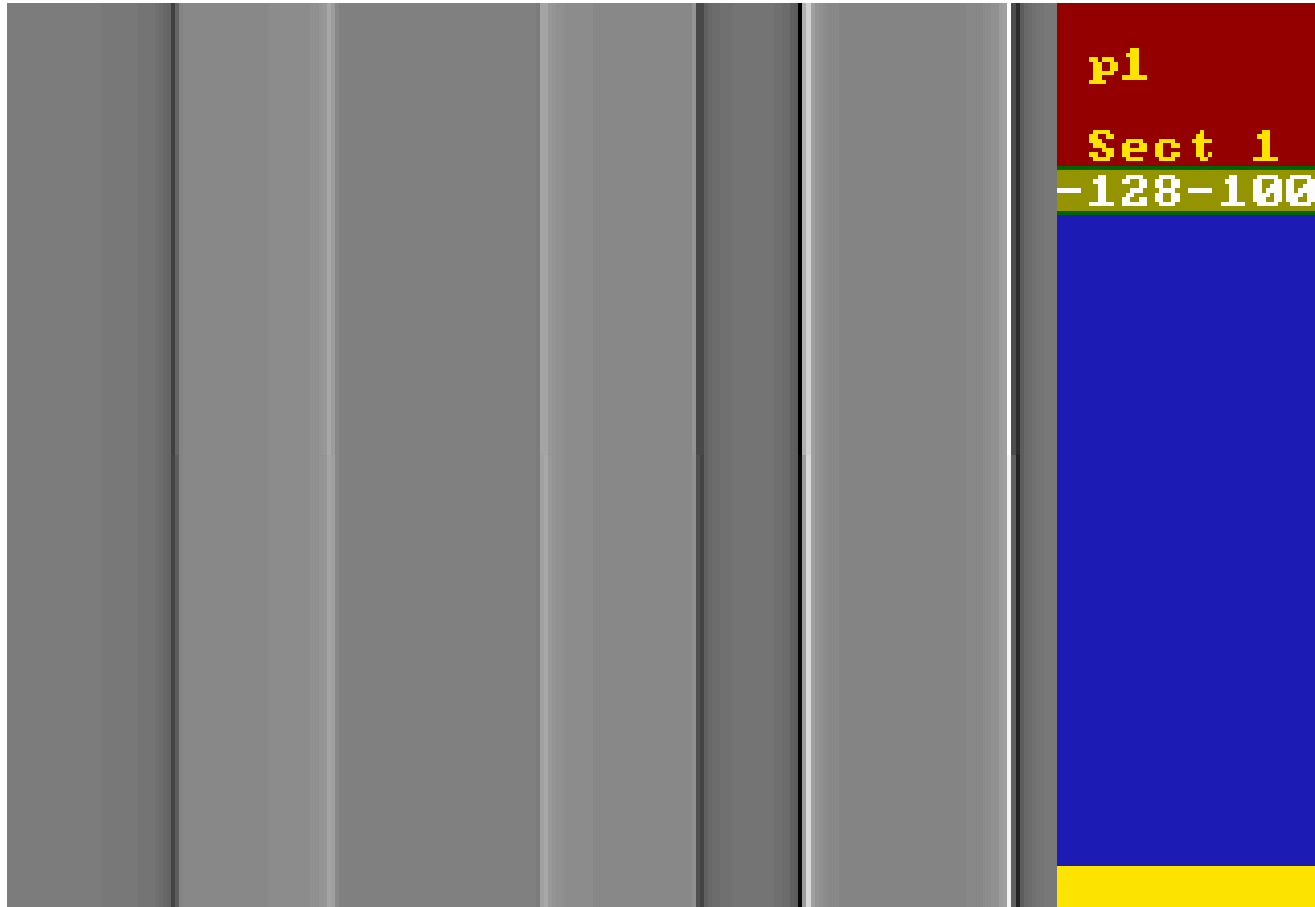
# Lots of Projections



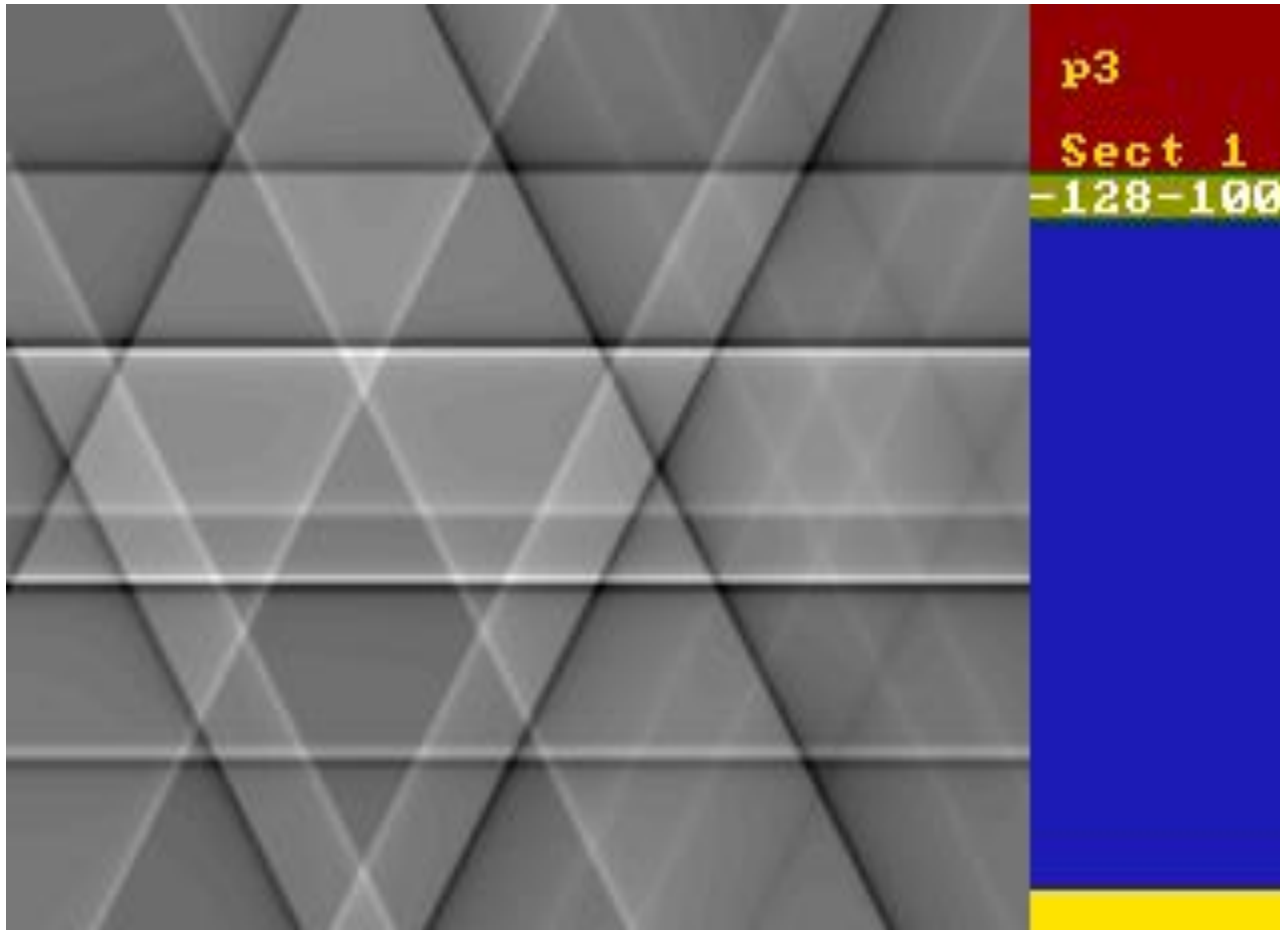
# Projections in frequency domain



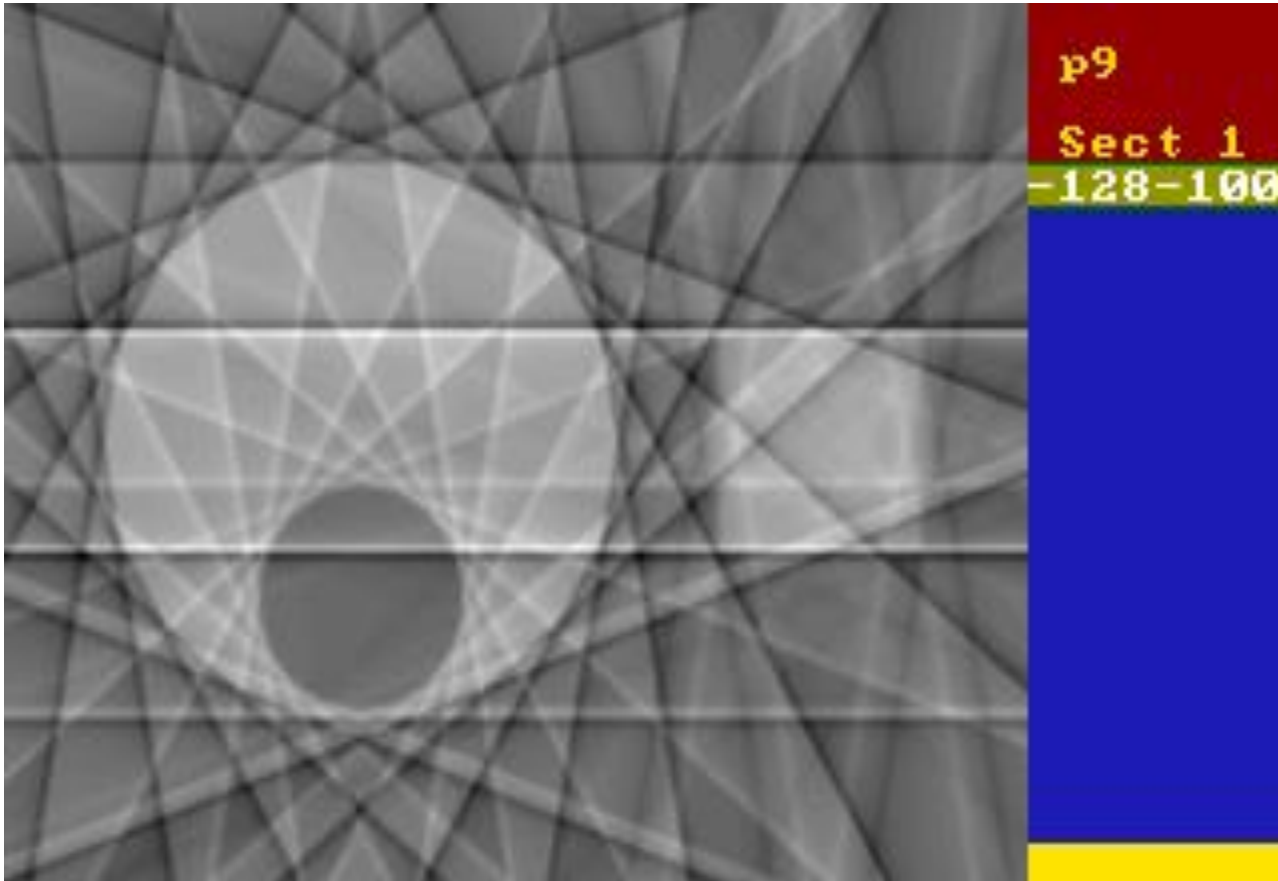
# 1 Filtered Projection



# 3 Filtered Projections

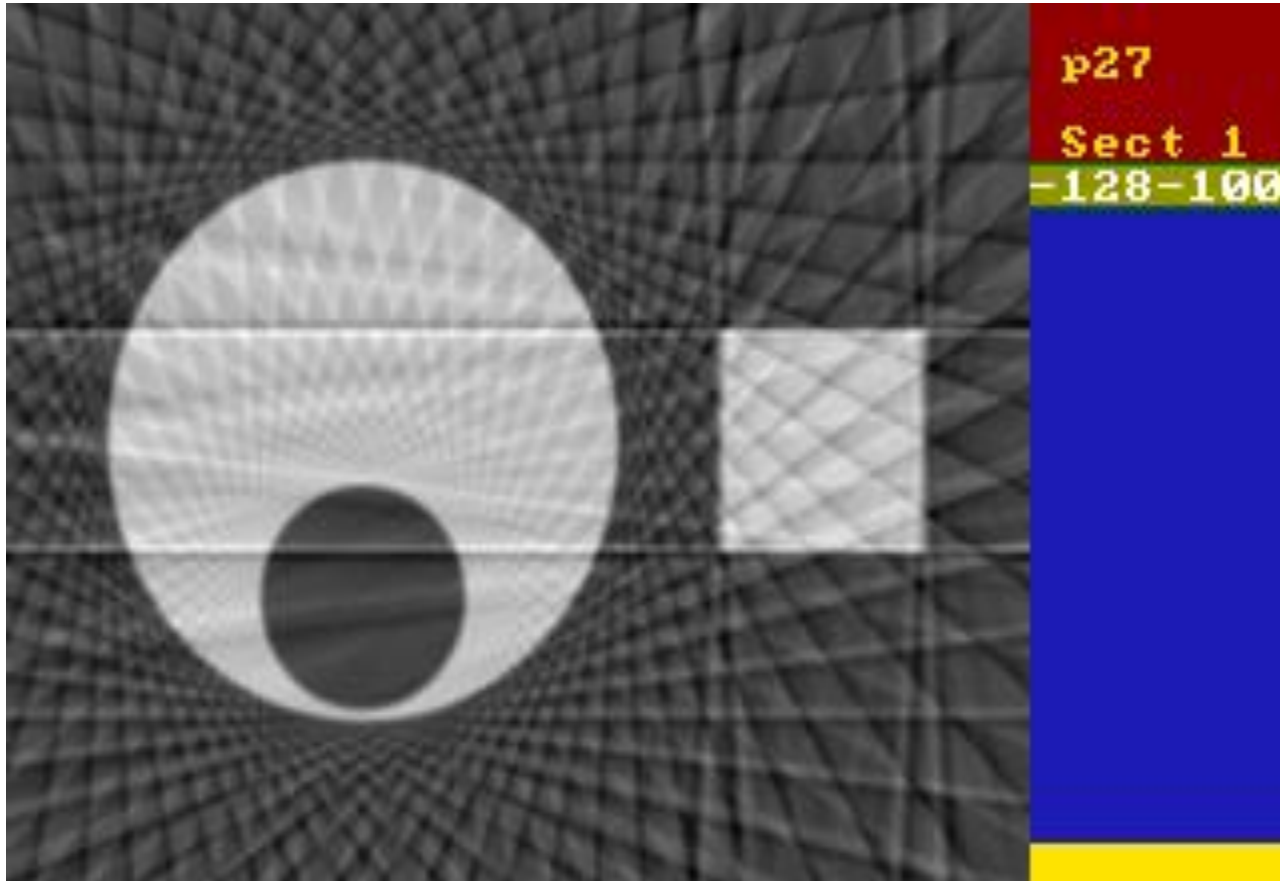


# 9 Filtered Projections

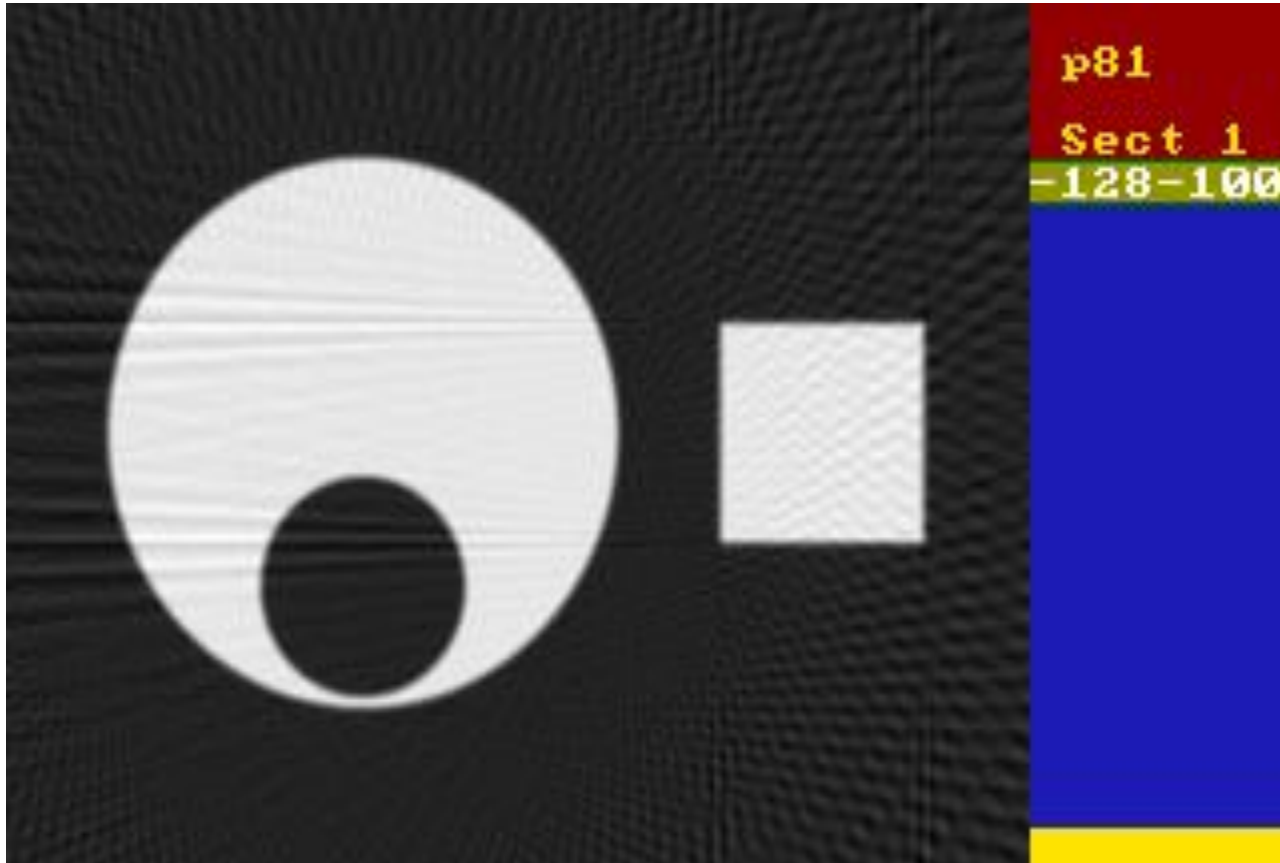




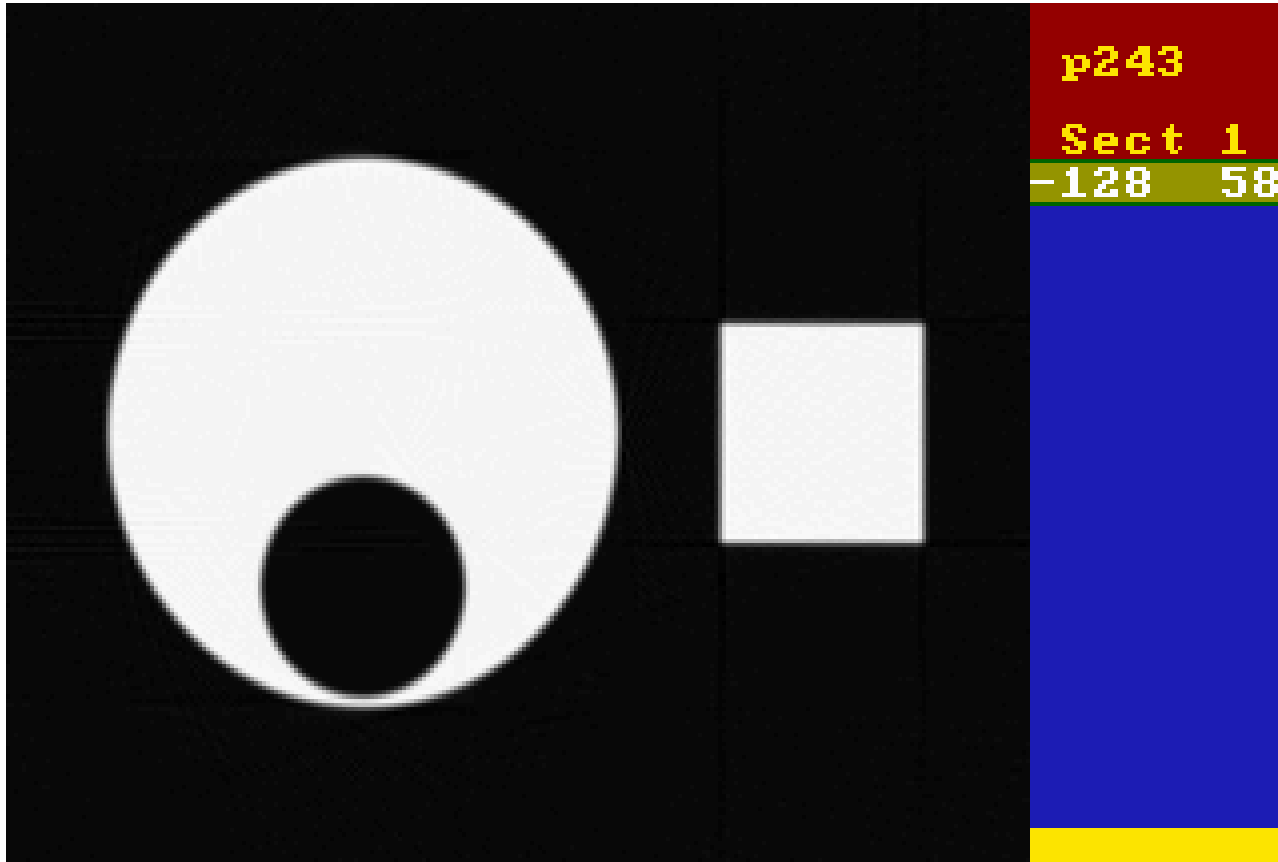
# 27 Filtered Projections



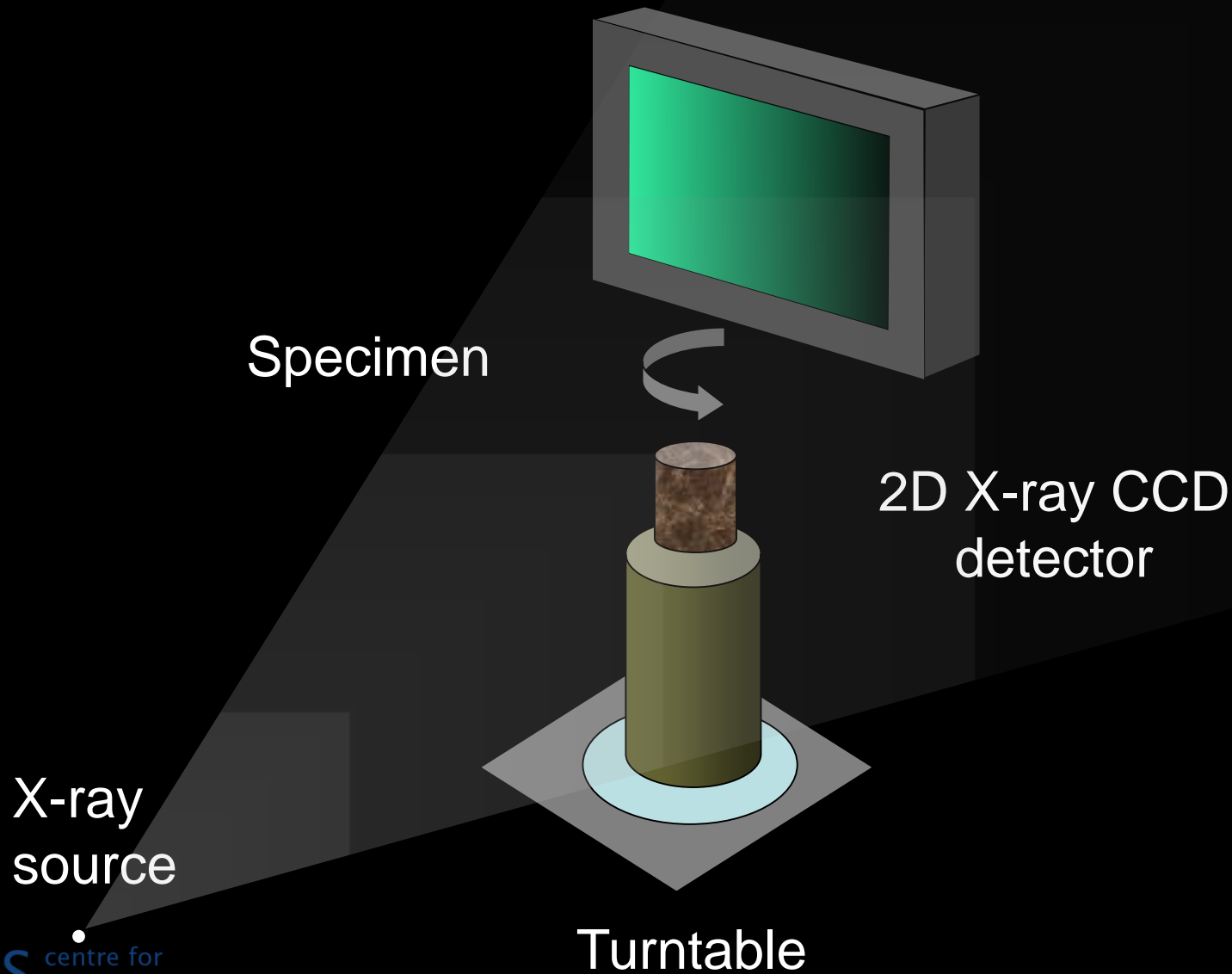
# 81 Filtered Projections



# 243 Filtered Projections

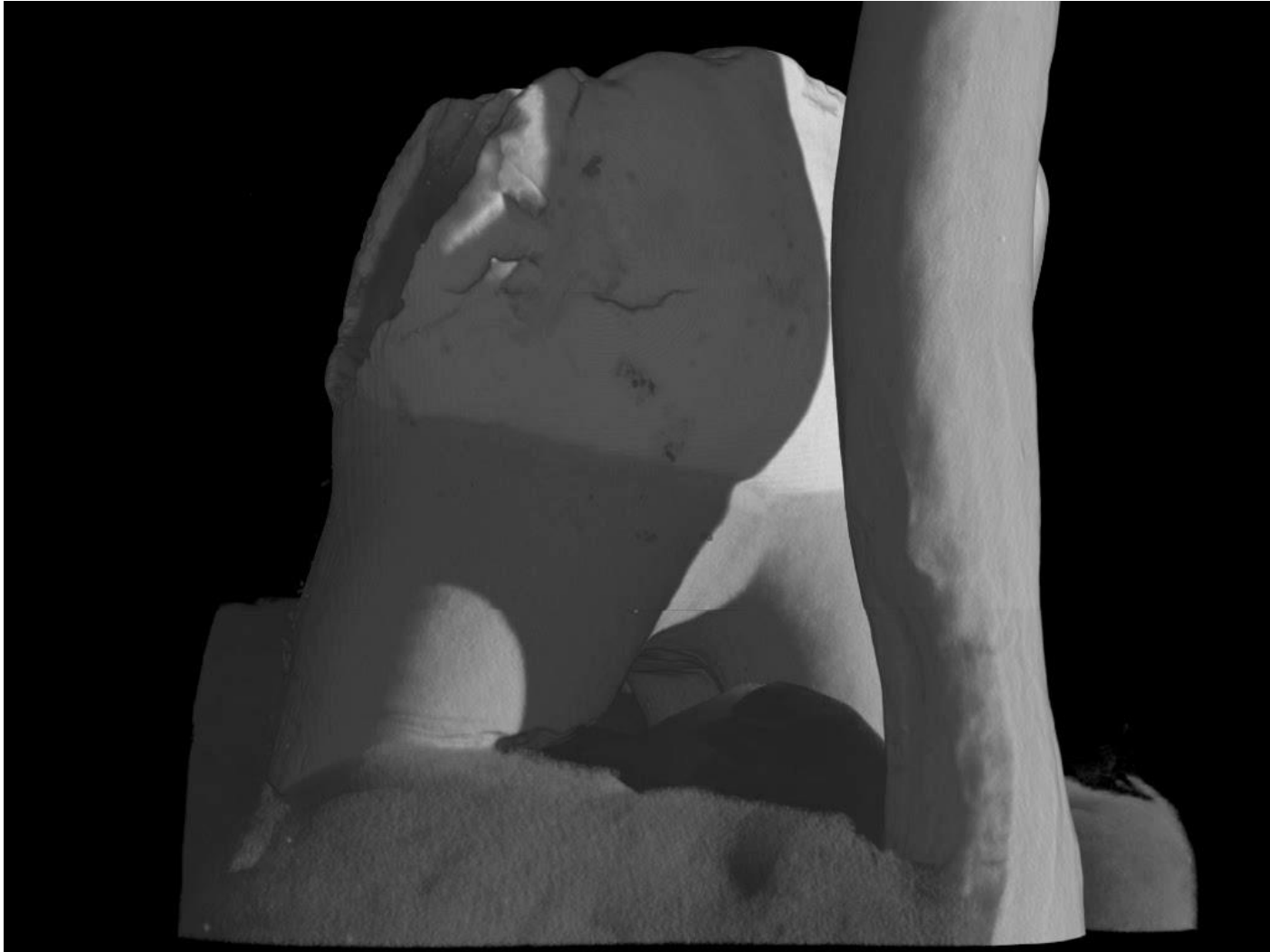


# TDI scanner

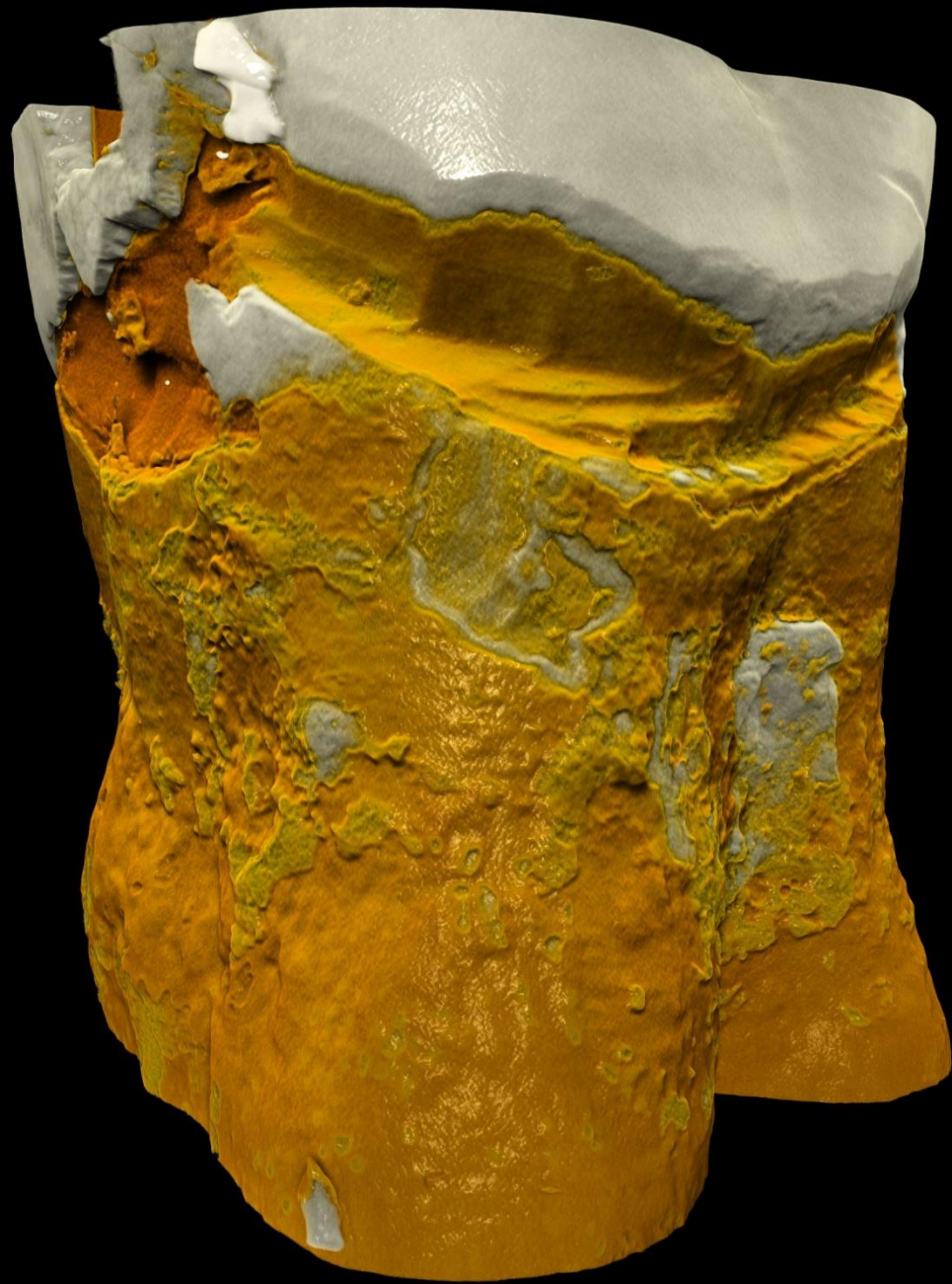


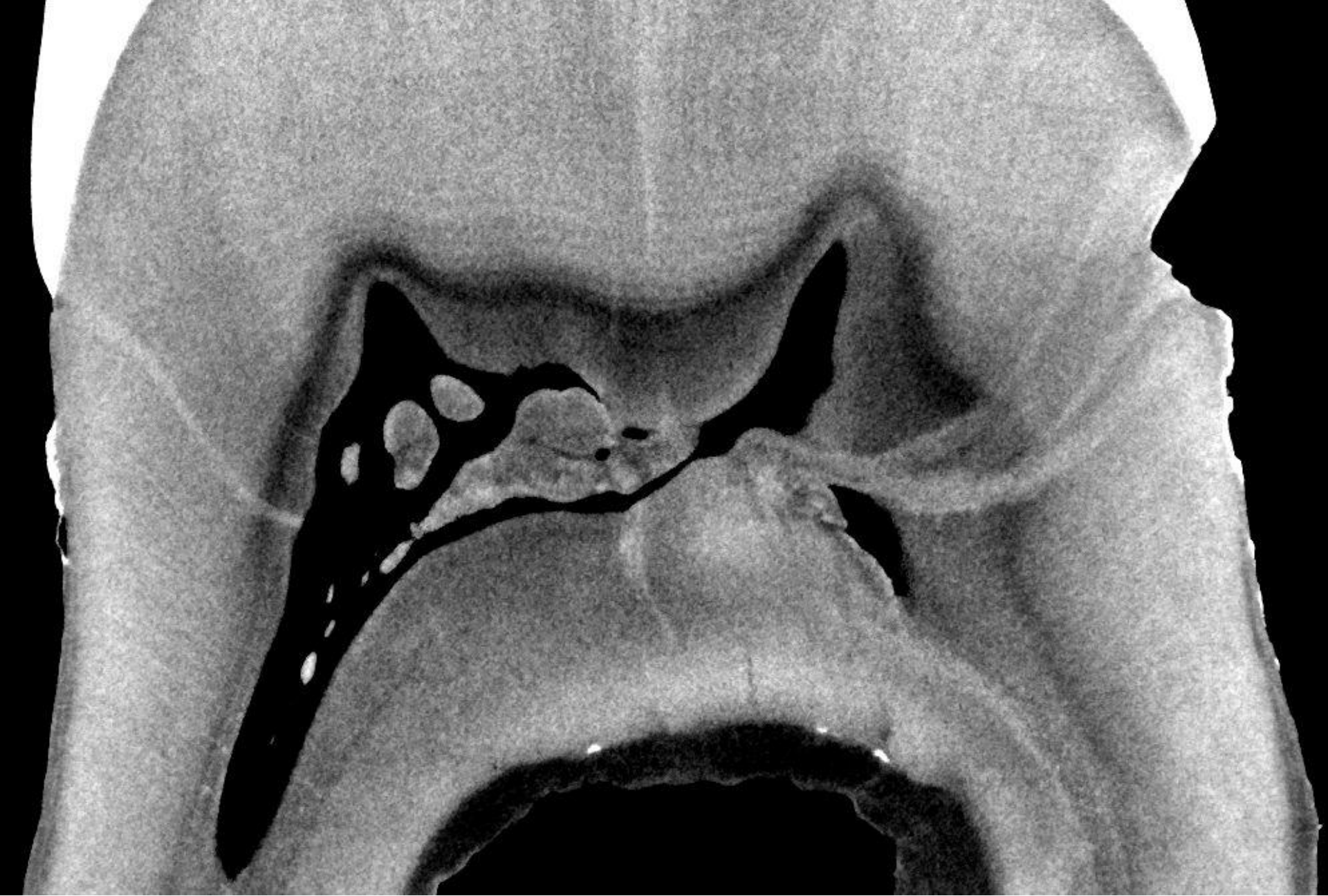
# Applications in dentistry

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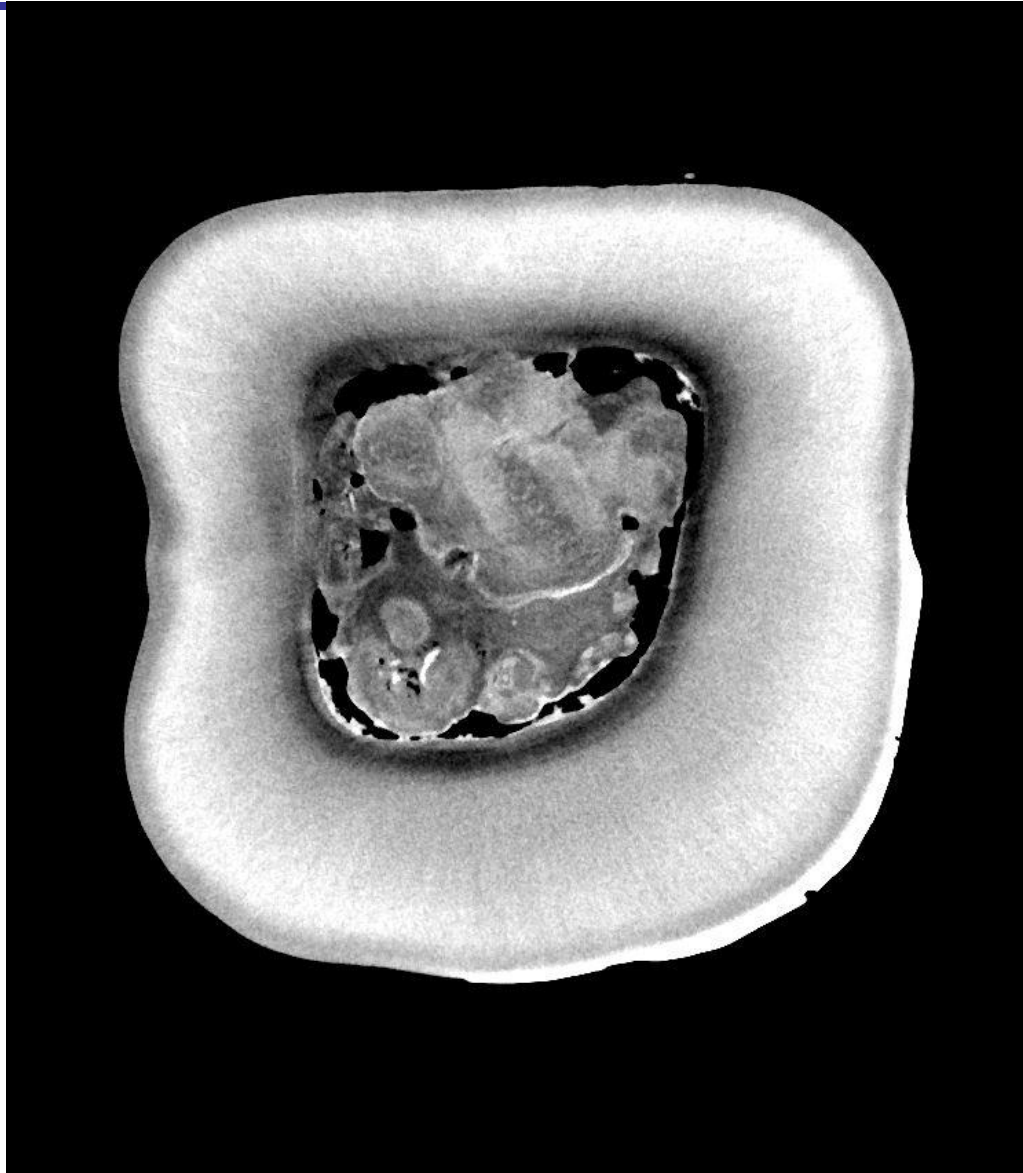






# Applications in dentistry

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# The Apokalypto Project

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**What's unreadable?**

Simple answer?

A small percentage of an archive's holding.

Potentially hundreds or thousands of heritage items.

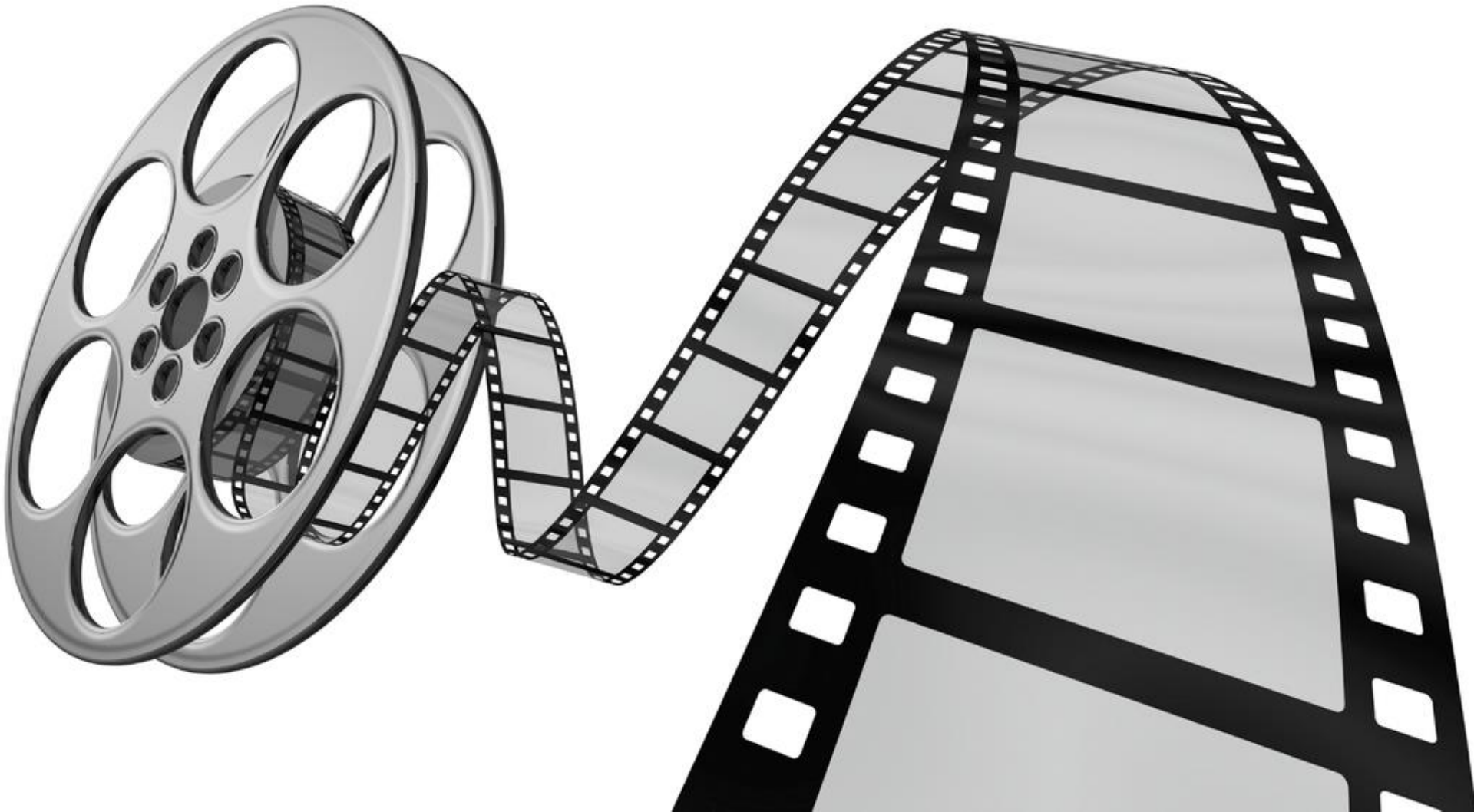
Parchment scrolls. Birch bark rolls. Textiles. Codices.





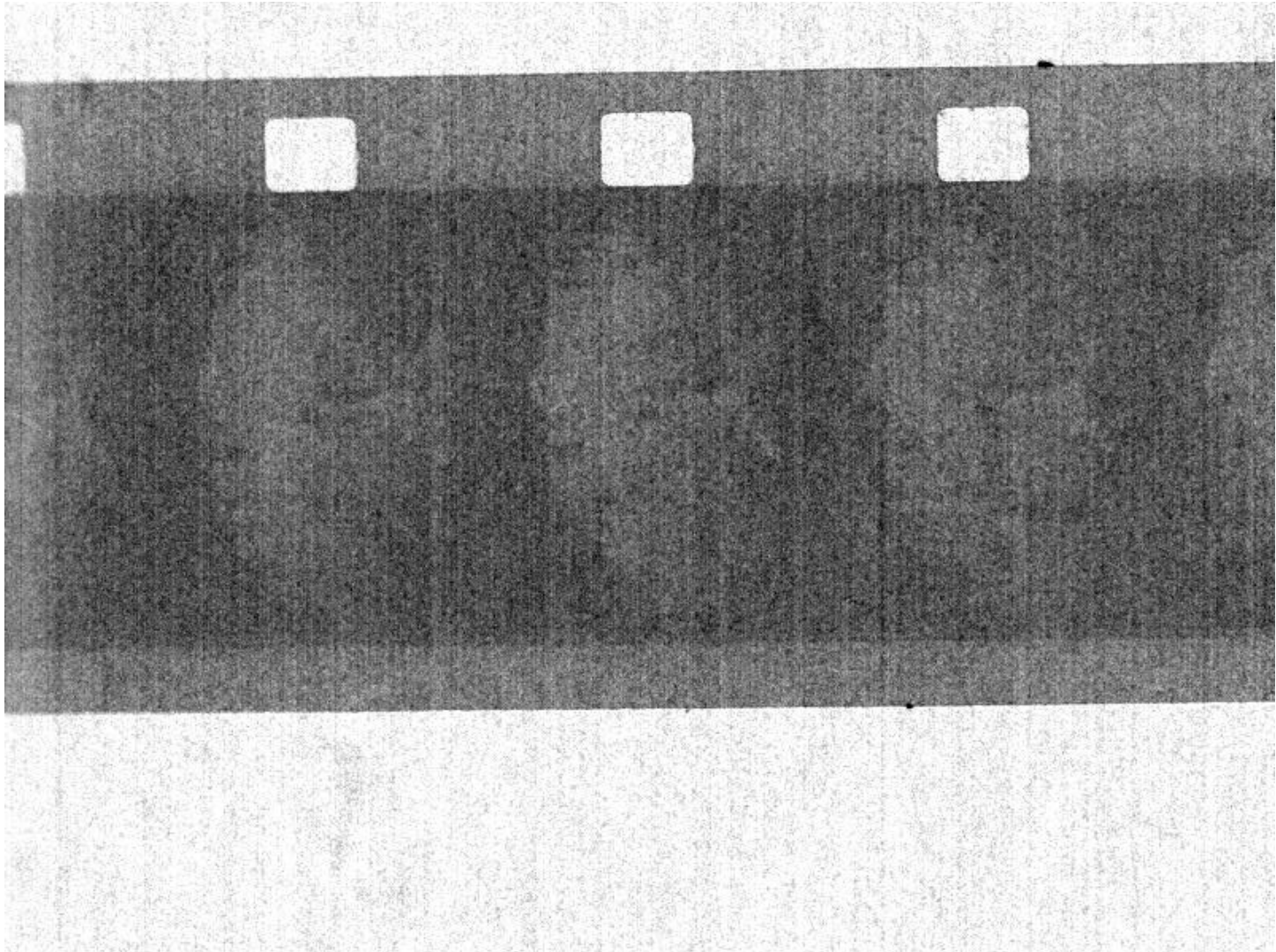
# A new challenge

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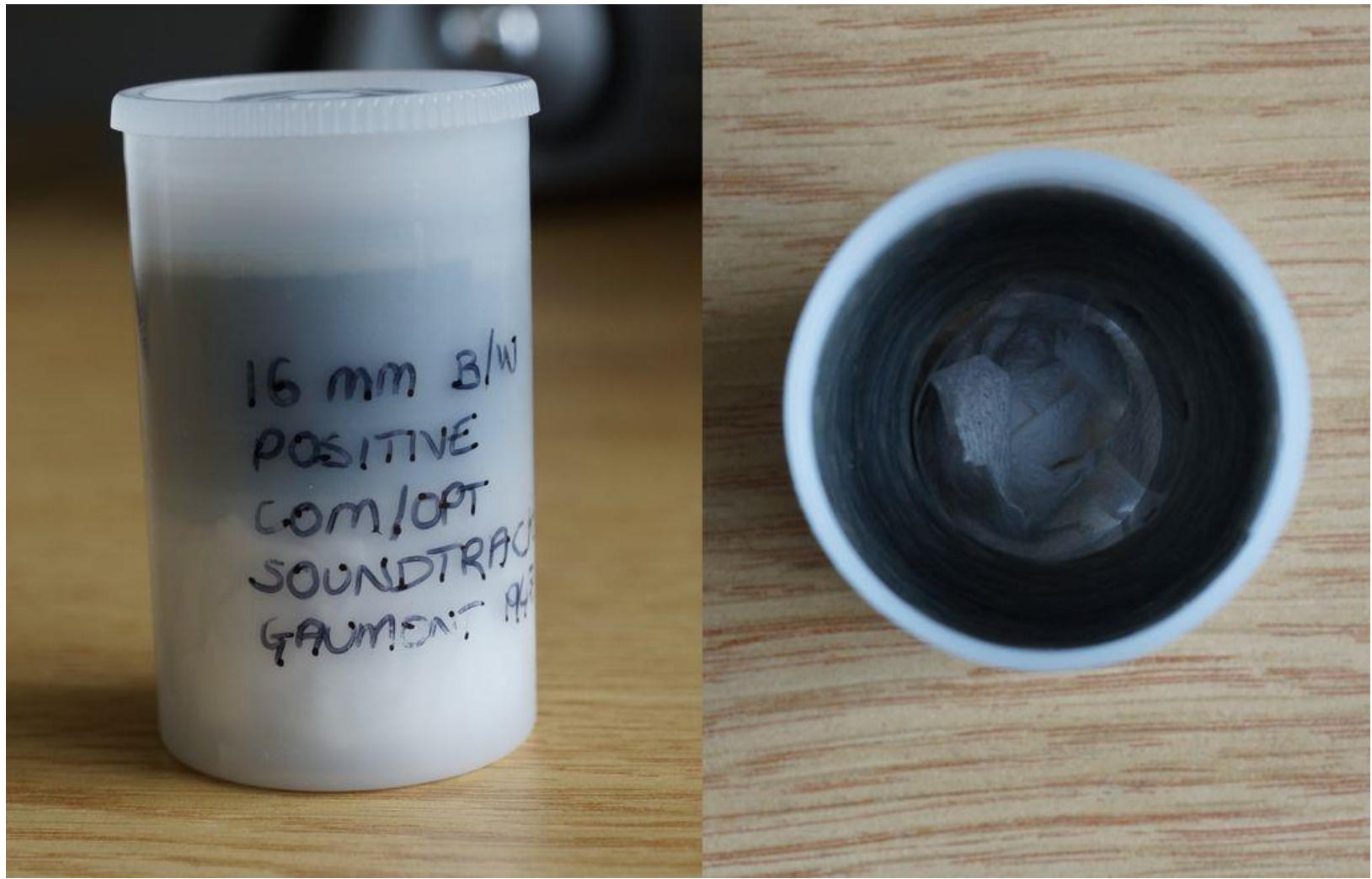
# Single projection of 8 mm film

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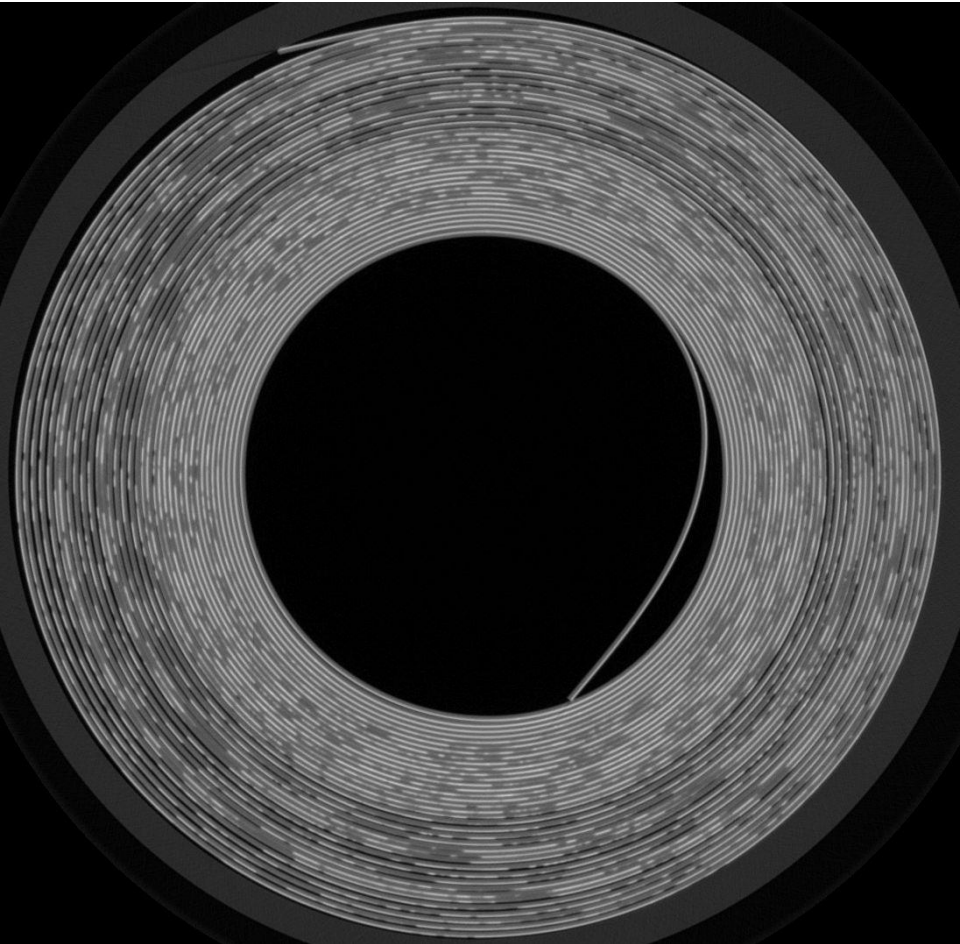
# 16 mm film sample

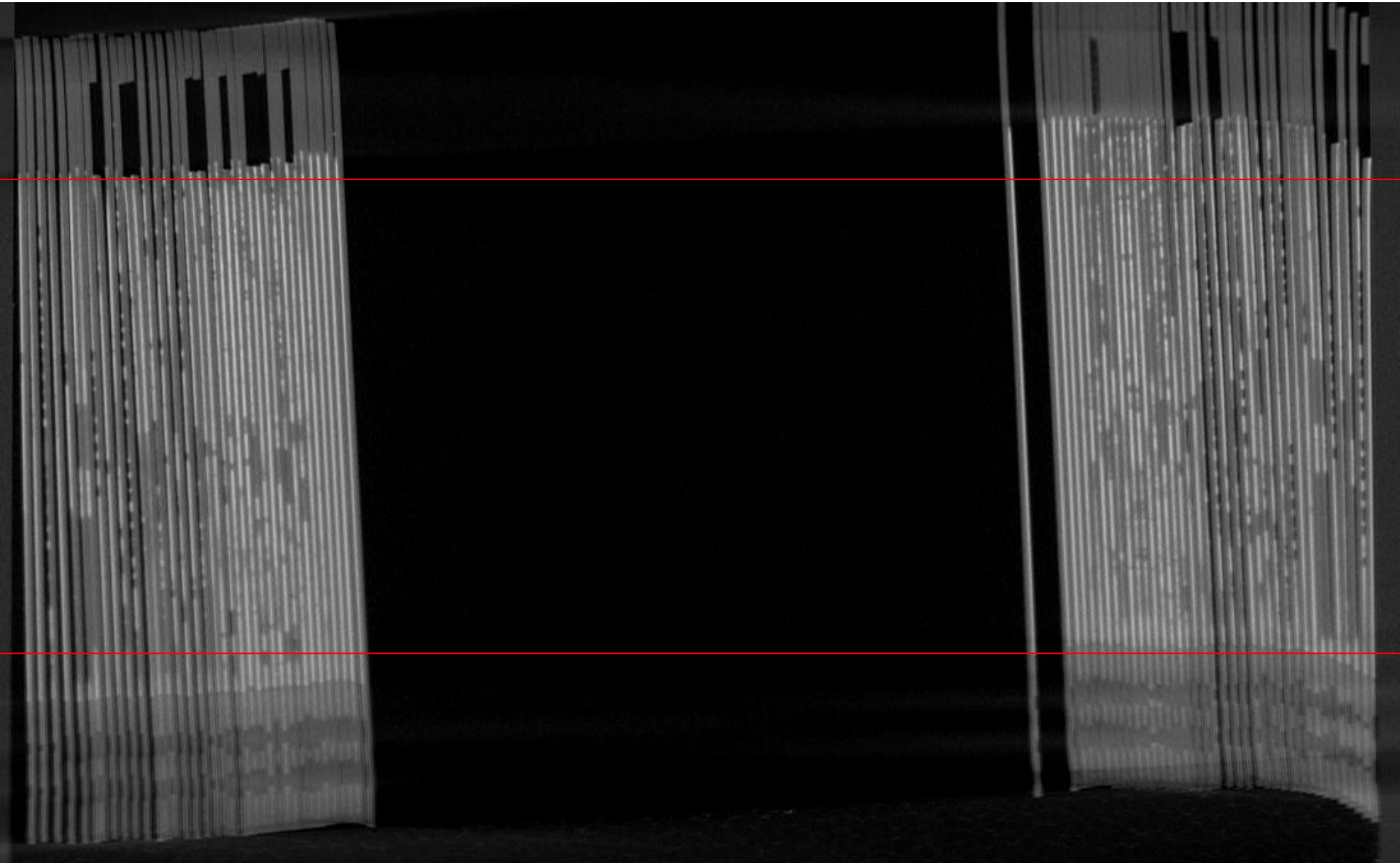
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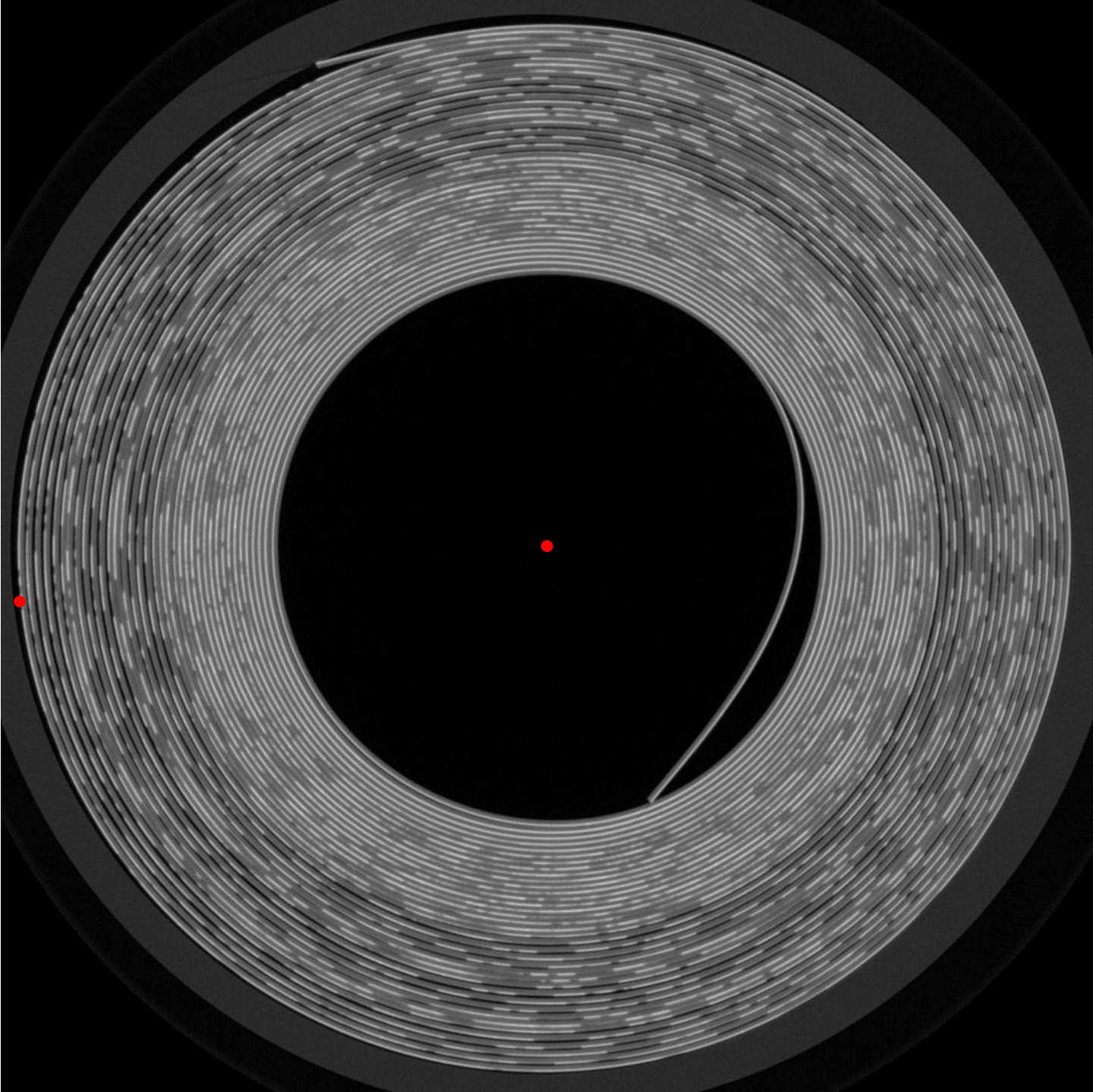
# X-ray microtomography of 16 mm film

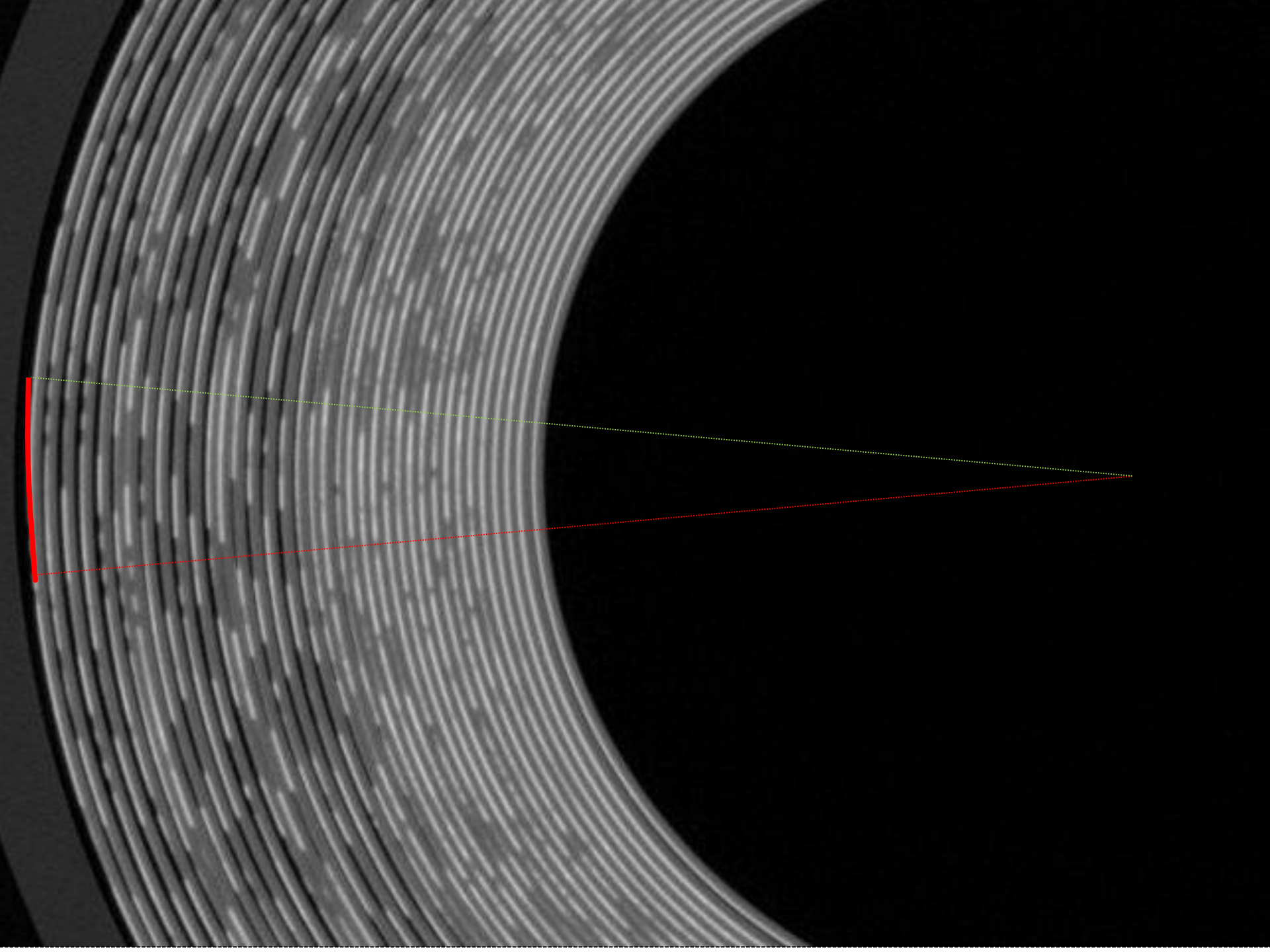
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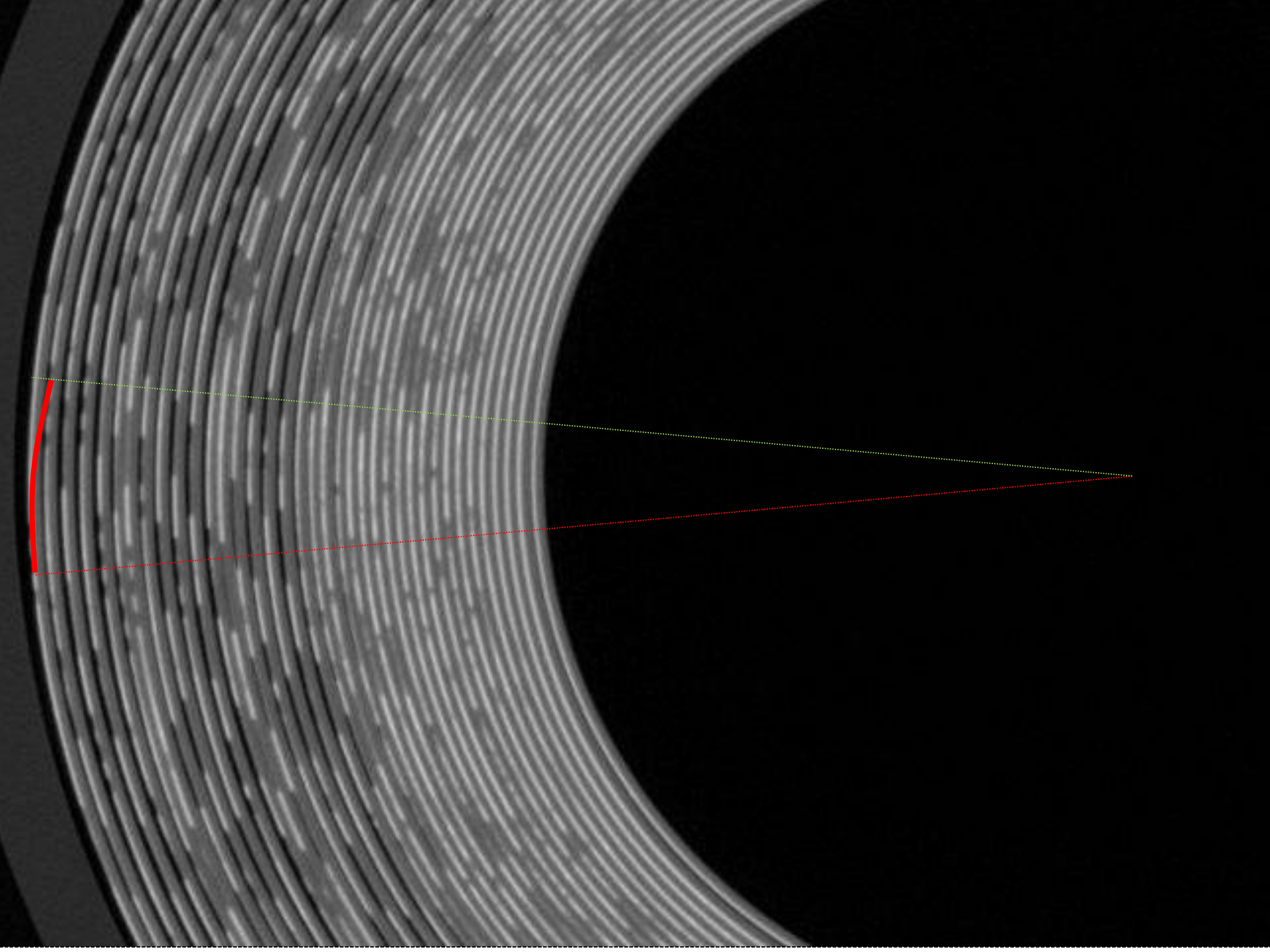


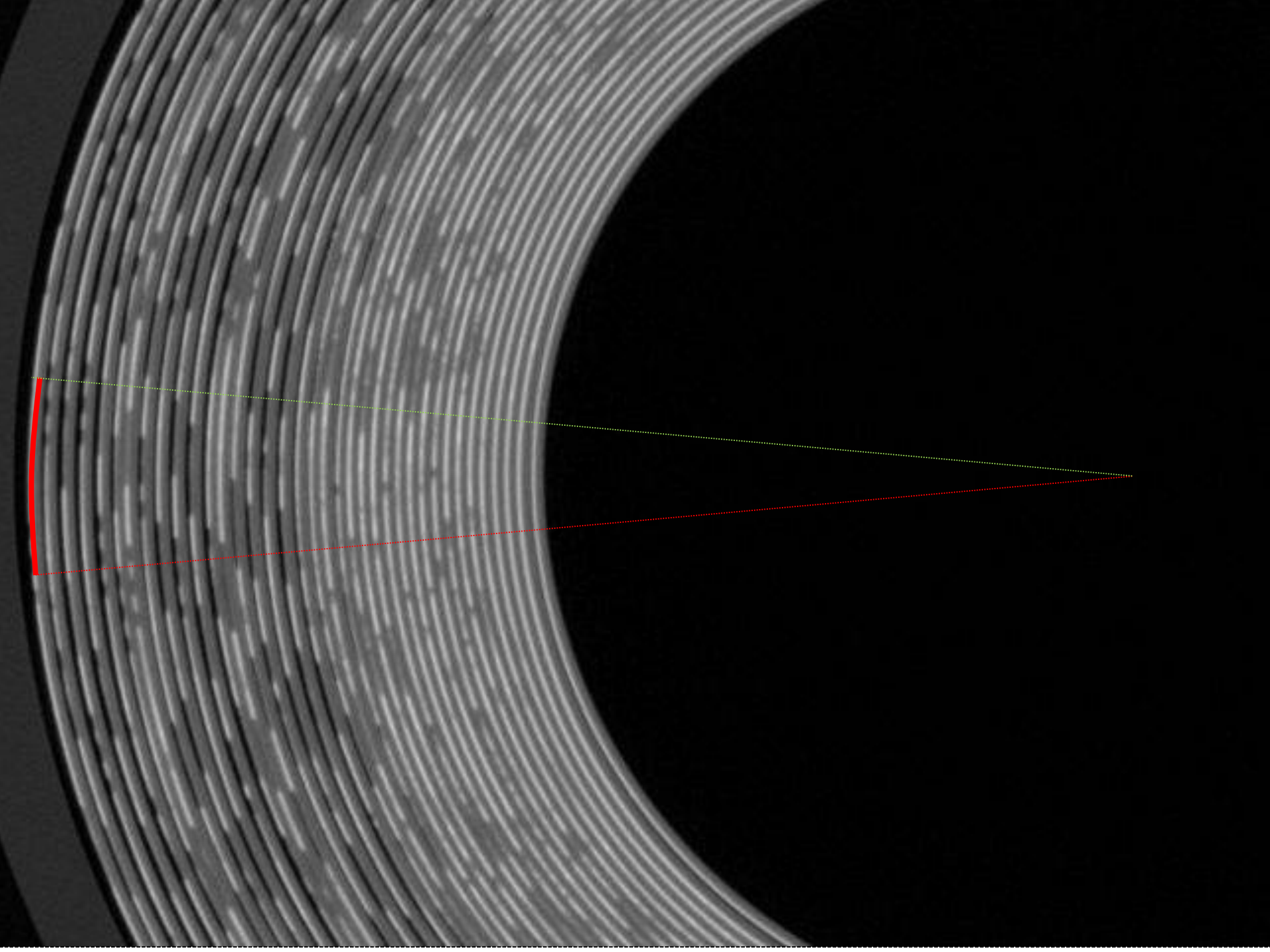


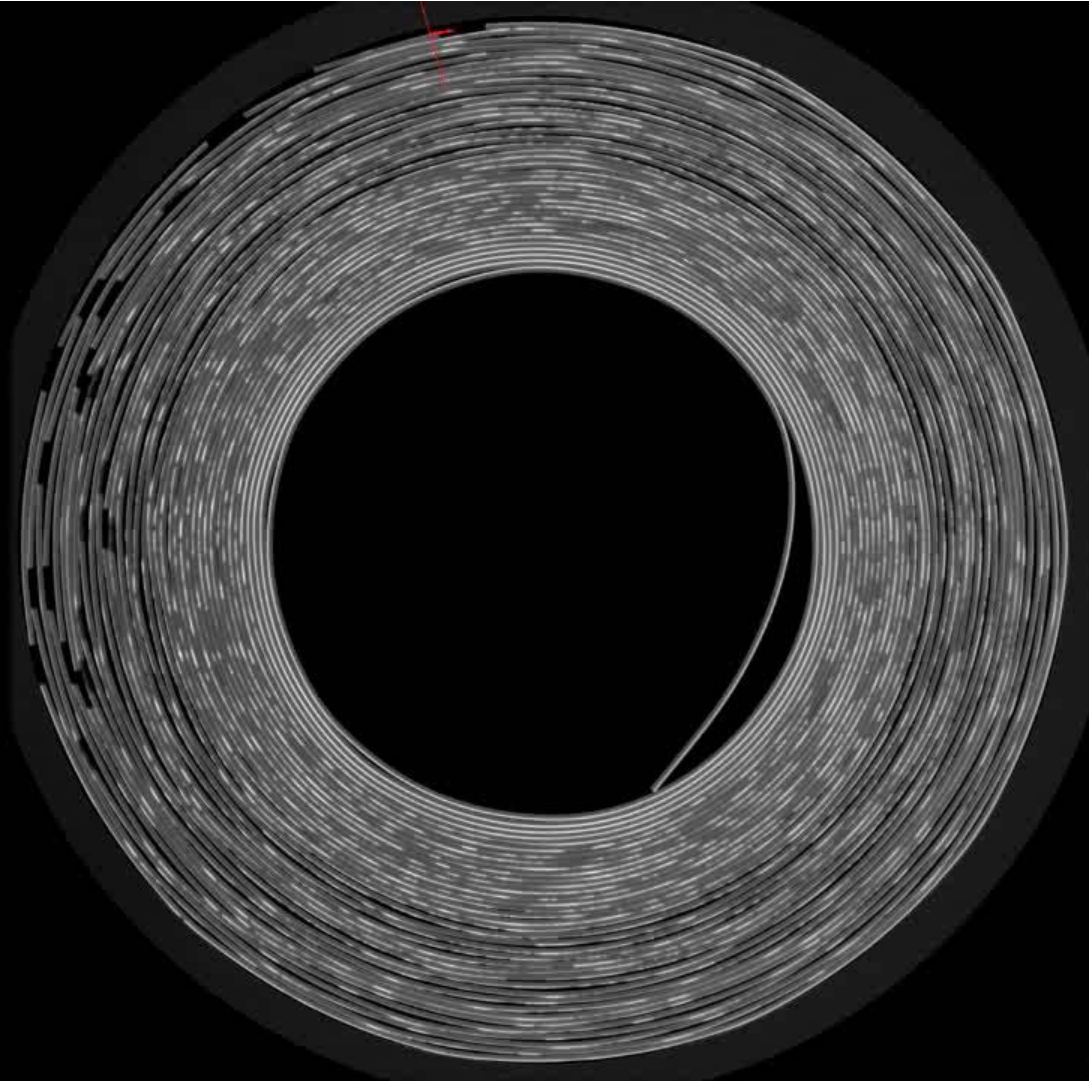


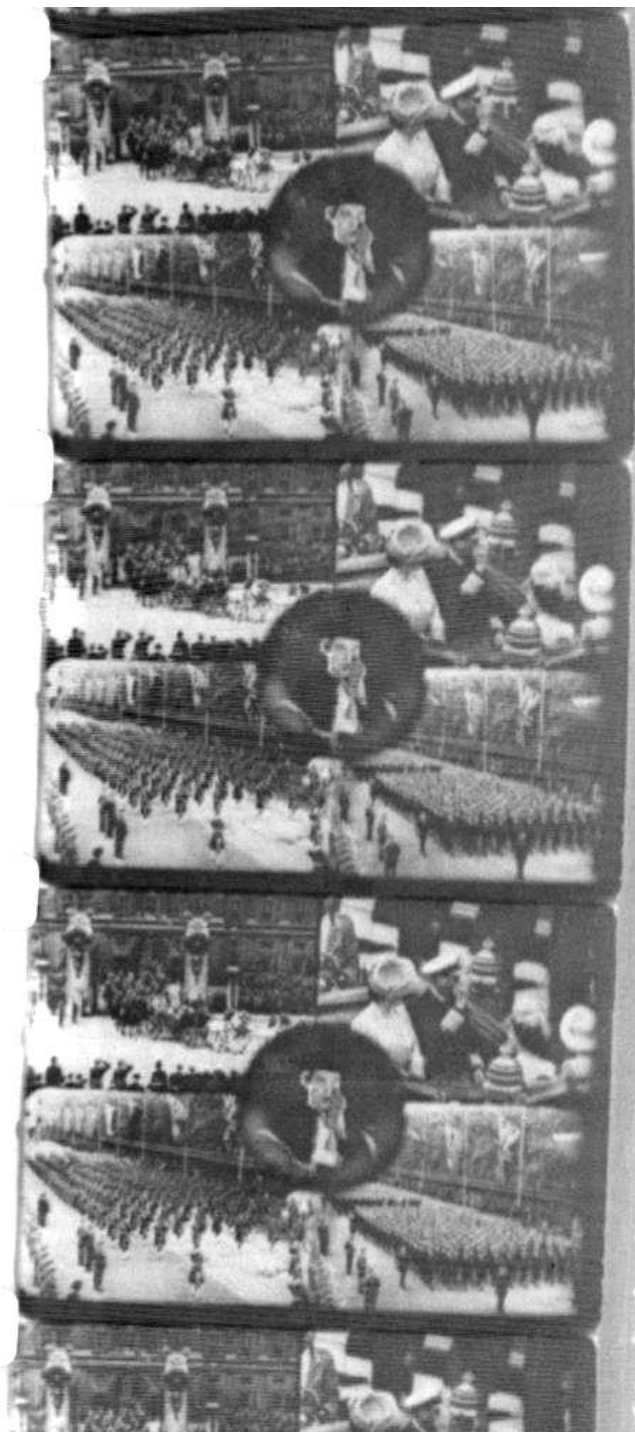


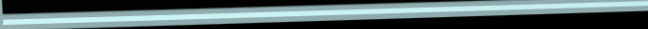













# Single unreeled frame

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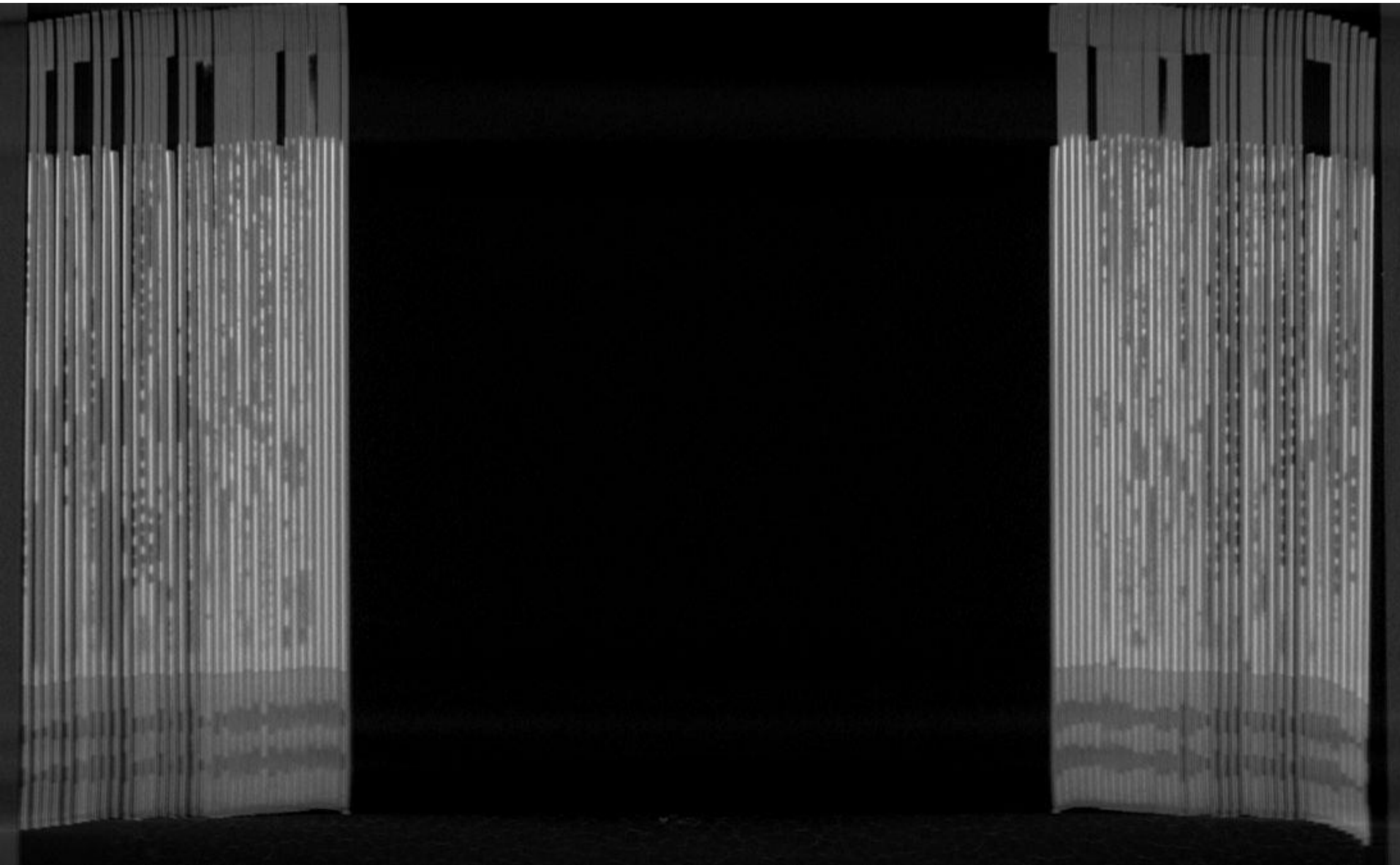




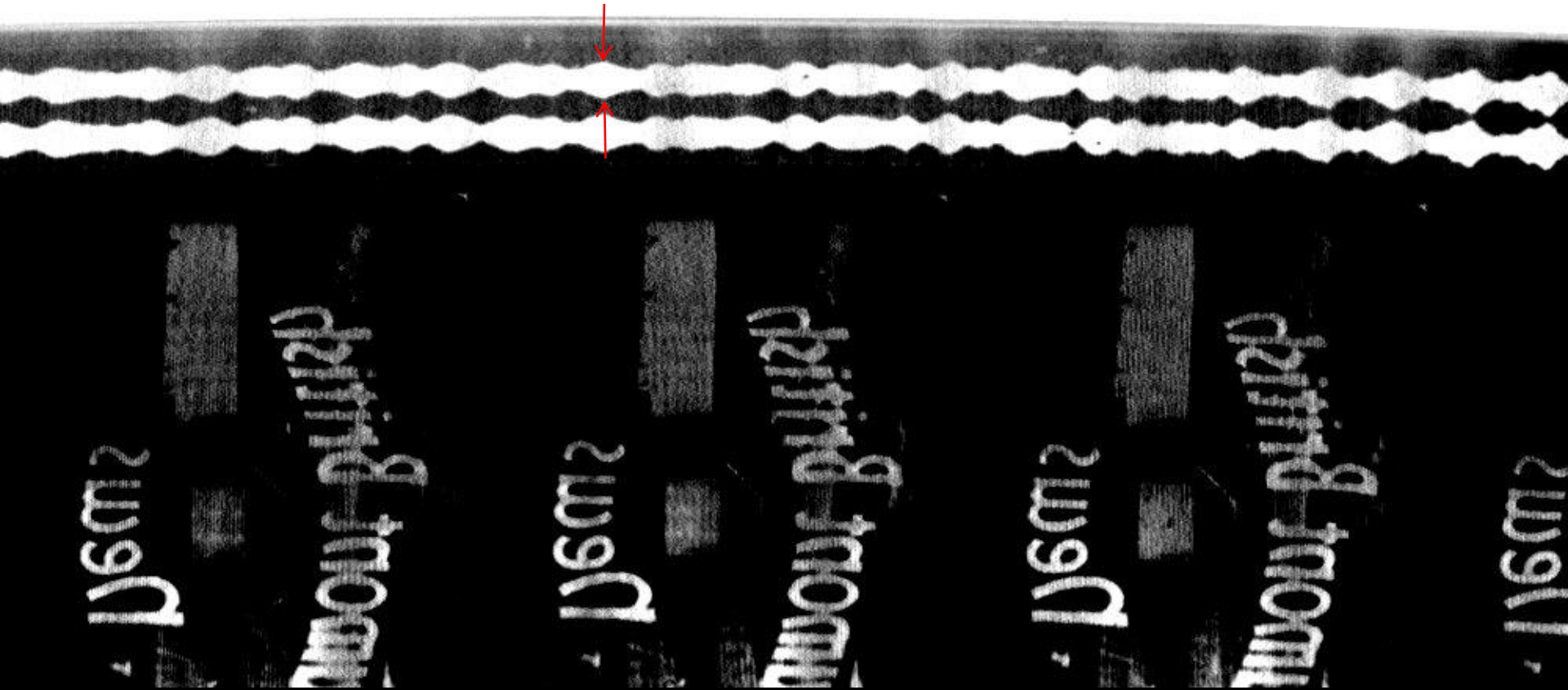
**What about the sound?**

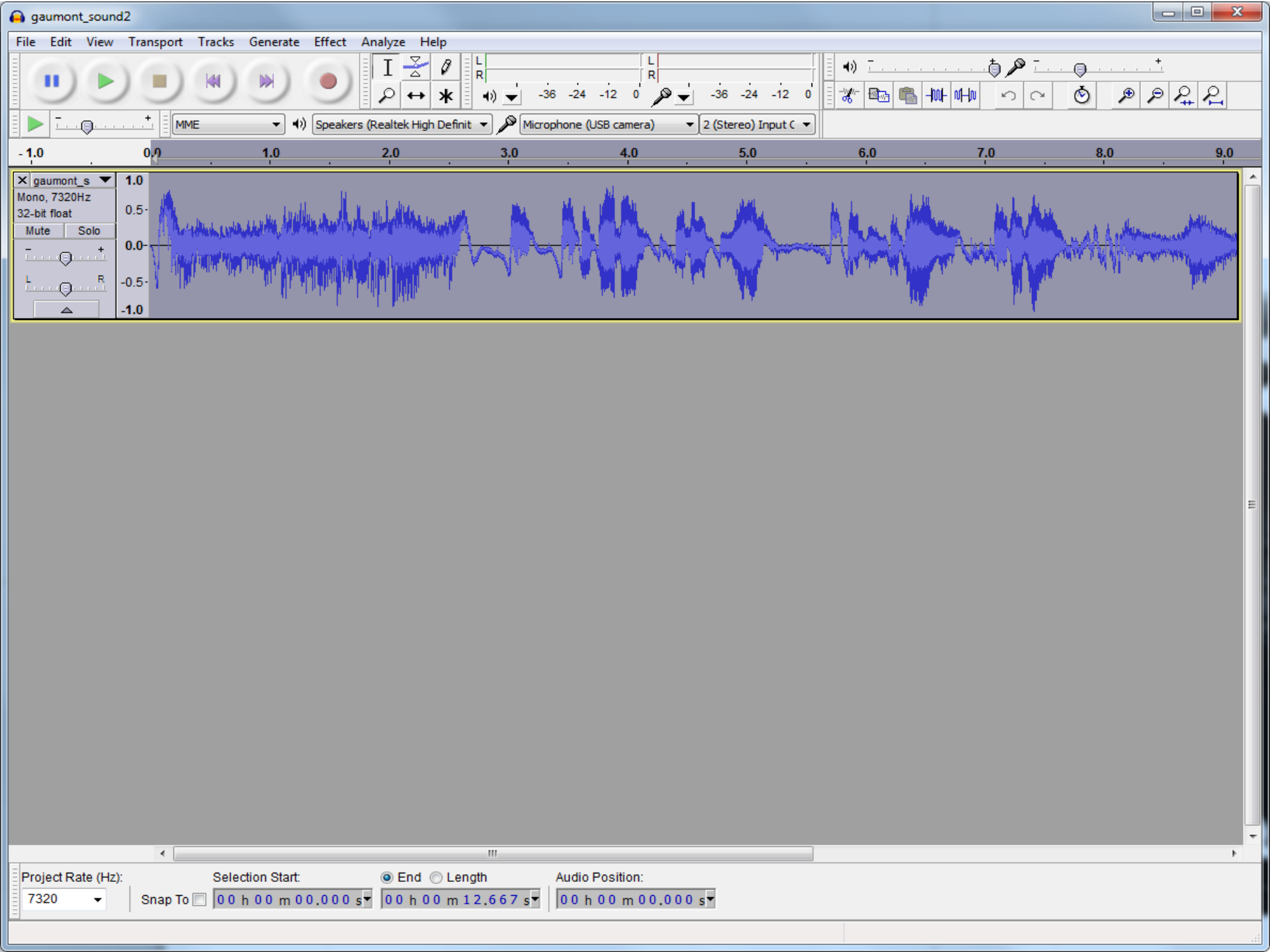
# Cone-beam Errors

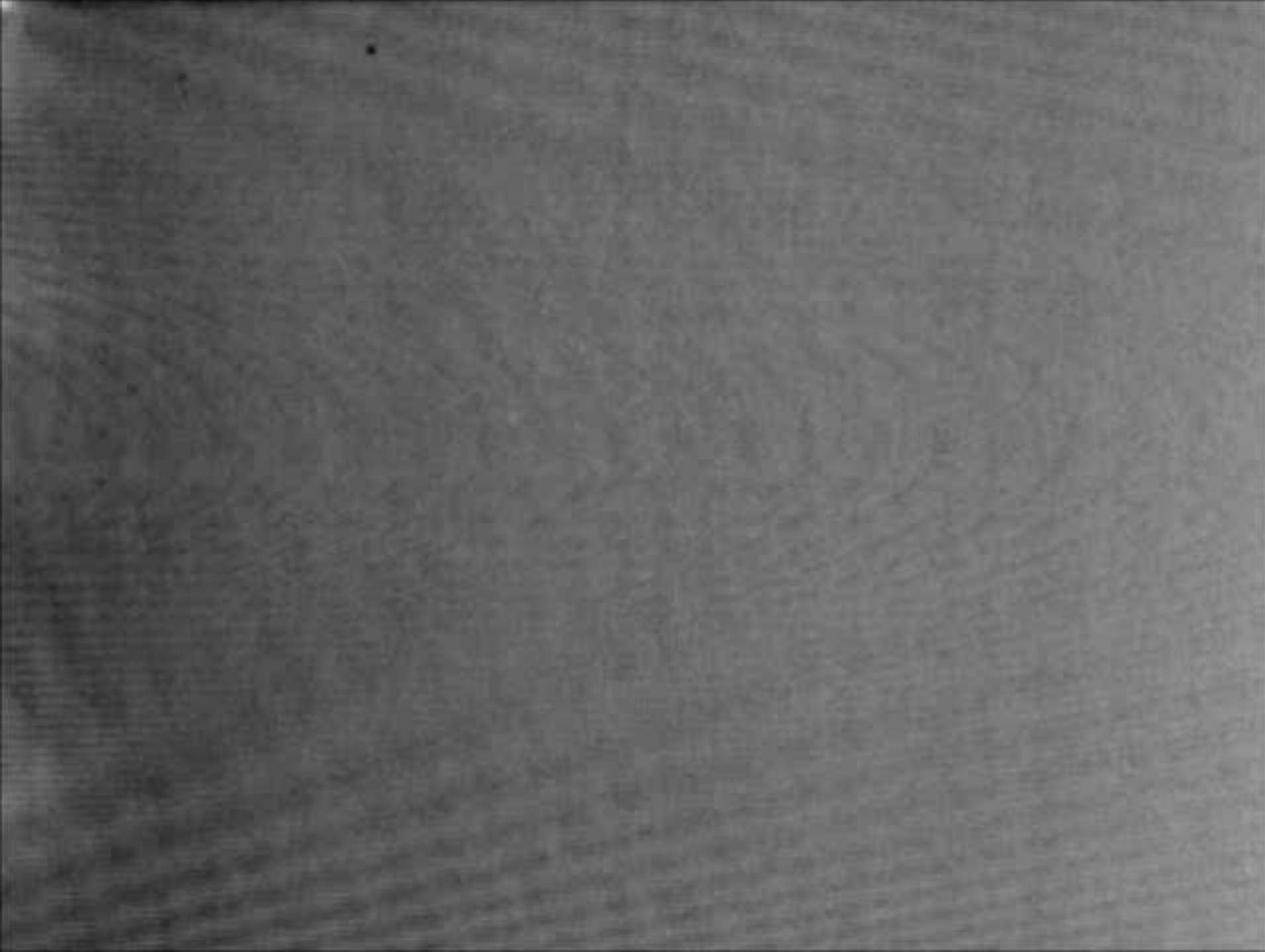




Sample rate = 7.32 kHz

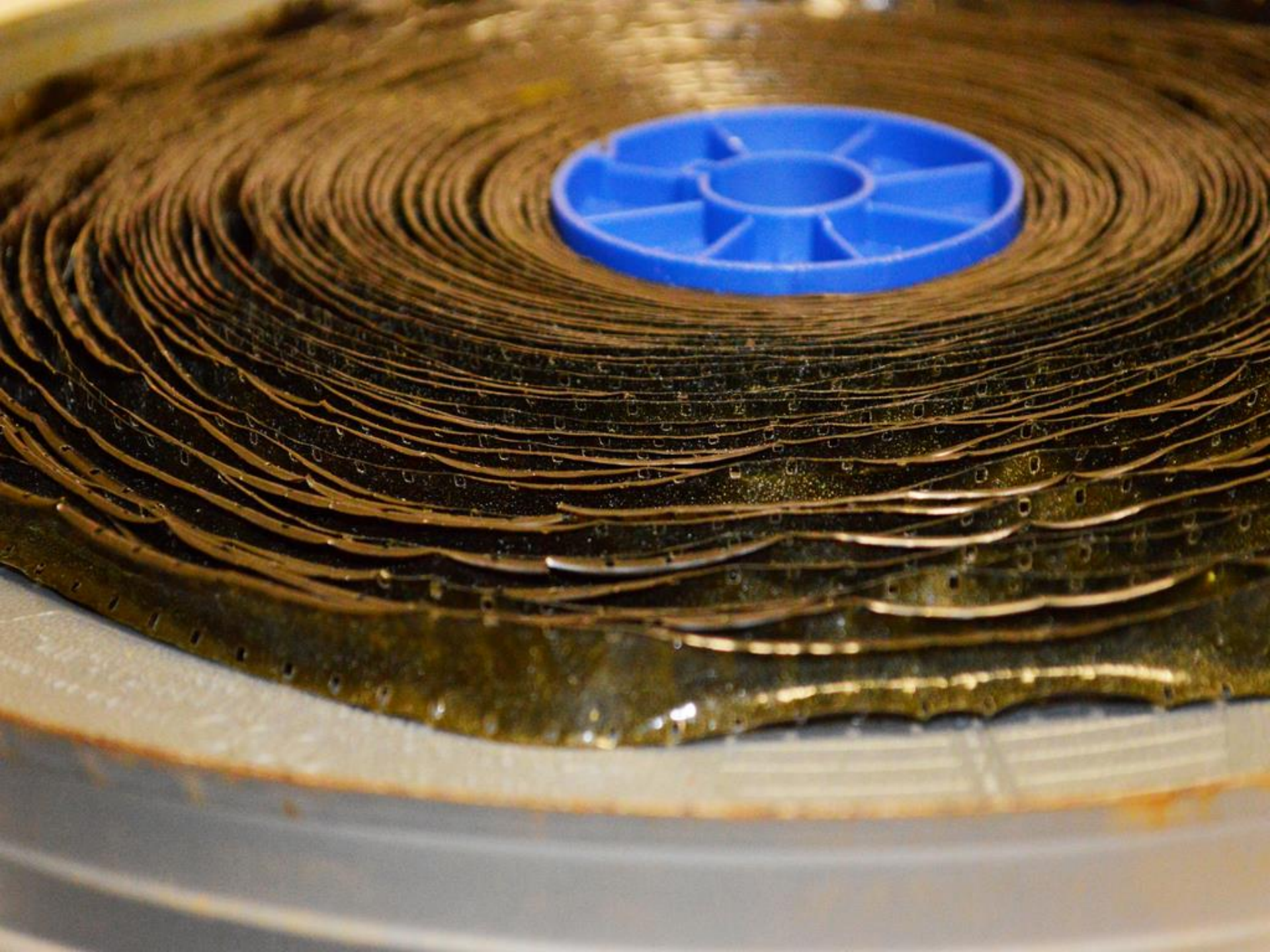






# Success?

Yes and no!





# Acknowledgements

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- Development of the MuCAT scanners was funded by the Engineering and Physical Sciences Research Council EP/G007845/1
- David Mills now manages the XMT facility
- Paul Rosin and Yukan Lai (University of Cardiff) scroll unrolling.
- Film samples were provided by Charles Norton.