THE WATERMARKS PROJECT

Documenting watermarks from the Rijksmuseum's *17th century Dutch drawings collection* with low-energy X-ray radiography

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RIJKS MUSEUM

Conservation & Science Department

8th International Conference on Watermarks in Digital Collections

PREVIEW

1. Introduction to the project and its purpose
2. X-ray instrumentation and process
3. Advantages and disadvantages of low energy X-rays
4. Storing files and metadata
5. Internal Research requests

INTRODUCING THE PROJECT

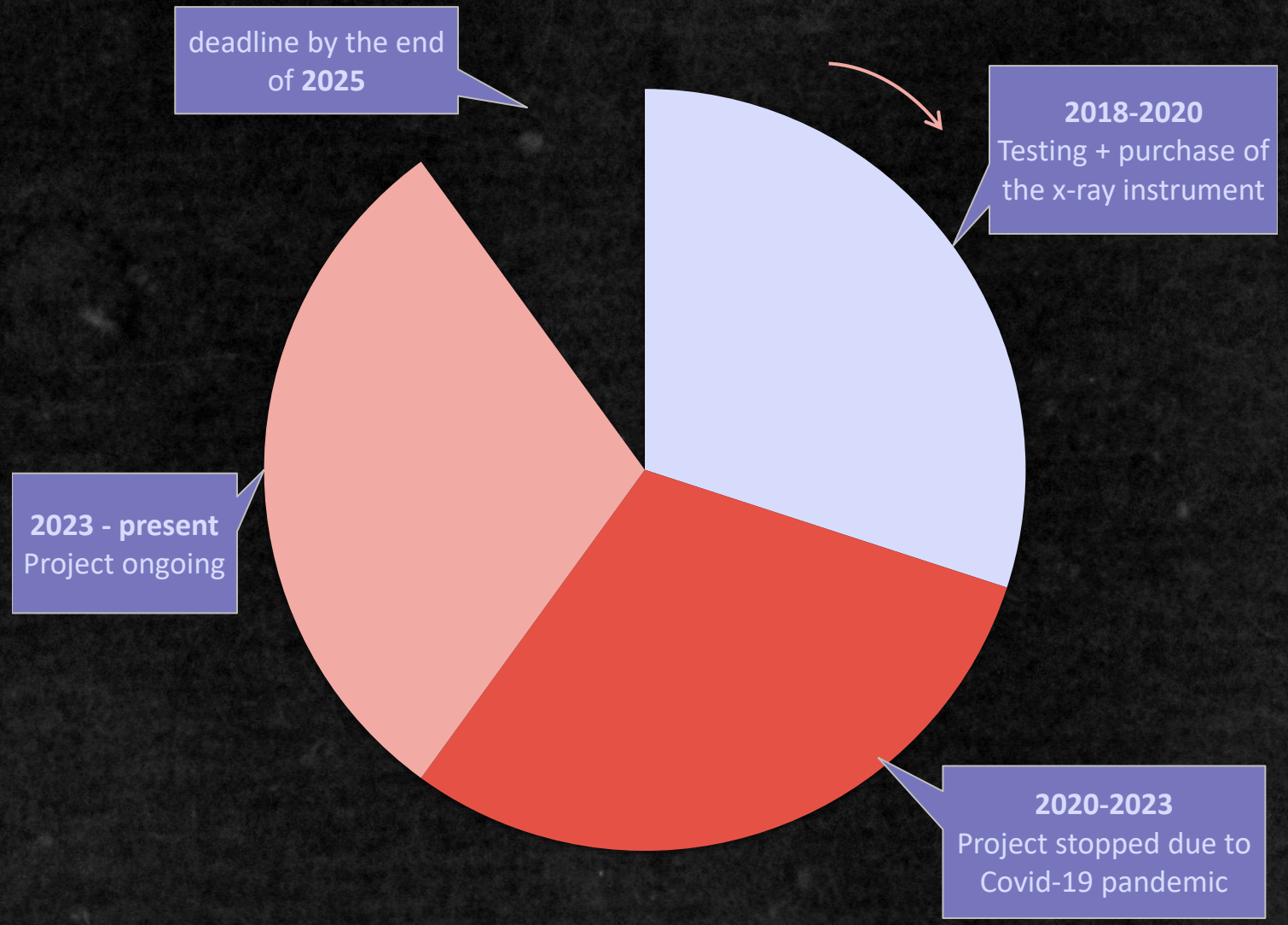
- The focus: X-ray imaging campaign of the 17th century Dutch drawings collection
- The collection of works of art on paper is the largest of the museum's collections
- The total number of drawings in the *17th century Dutch drawings collection:* **3.876**

RP-T-1887-A-957(R)
Woman with a baby followed by a child
Harmen ter Borch (mentioned on object), 1649-05-15

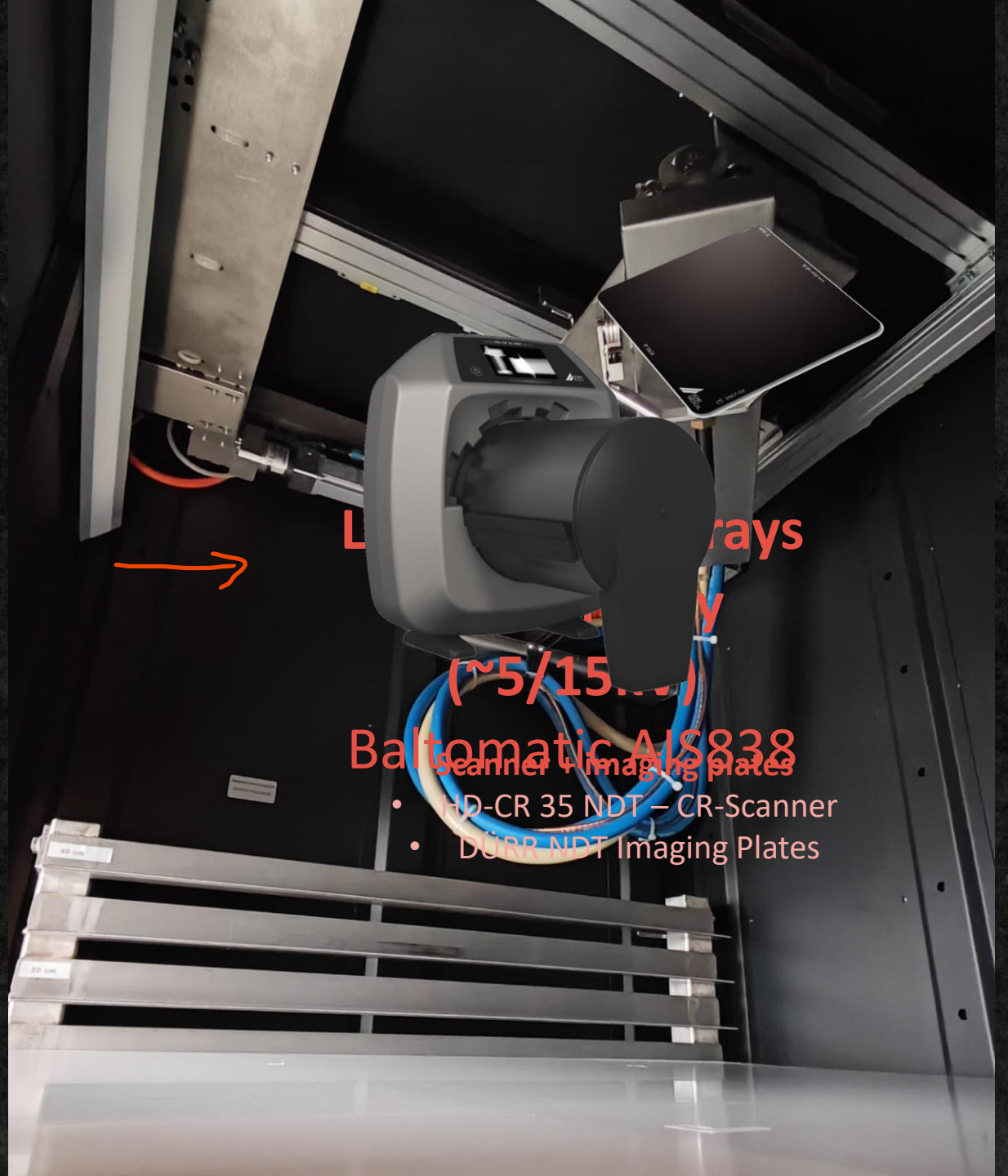
PURPOSE OF THE PROJECT

- to complement the photographic documentation of each drawing with the related X-ray image on the *Online Catalogue – Rijksmuseum*
- to build a consistent catalogue of watermarks in the collection

TIMELINE


deadline by the end of **2025**
2018-2020
Testing + purchase of the x-ray instrument
2023 - present
Project ongoing
2020-2023
Project stopped due to Covid-19 pandemic

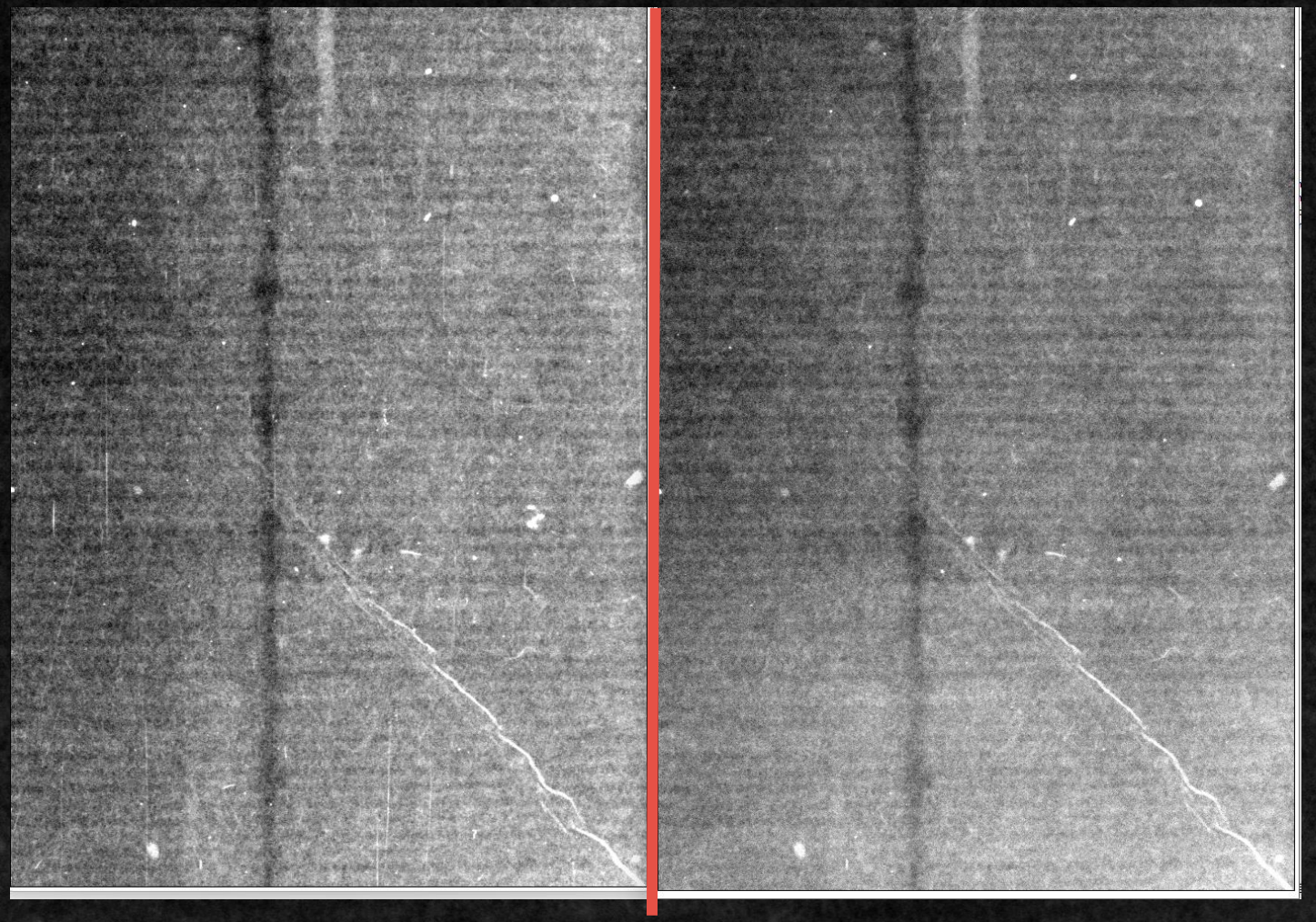

X-Ray Solutions
Balteau NDT
www.balteau.com
BALTOMATIC AIS838


L rays
y
(~5/15
Baltomatic AIS838
Scanner + Imaging plates
HD-CR 35 NDT – CR-Scanner
DÜRR NDT Imaging Plates

LOW-ENERGY X-RAYS AND HIGH-RESOLUTION DIGITAL IMAGING PLATES

Big IP

- 35x43cm
- Scanner resolution: 30 µm



Small IP

- 24x30cm
- Scanner resolution: 25 µm

7 kV - 4,2 mA – 240 sec – 70 cm

MOUNTING SOLUTION FOR DRAWINGS

MOUNTING SOLUTION FOR DRAWINGS

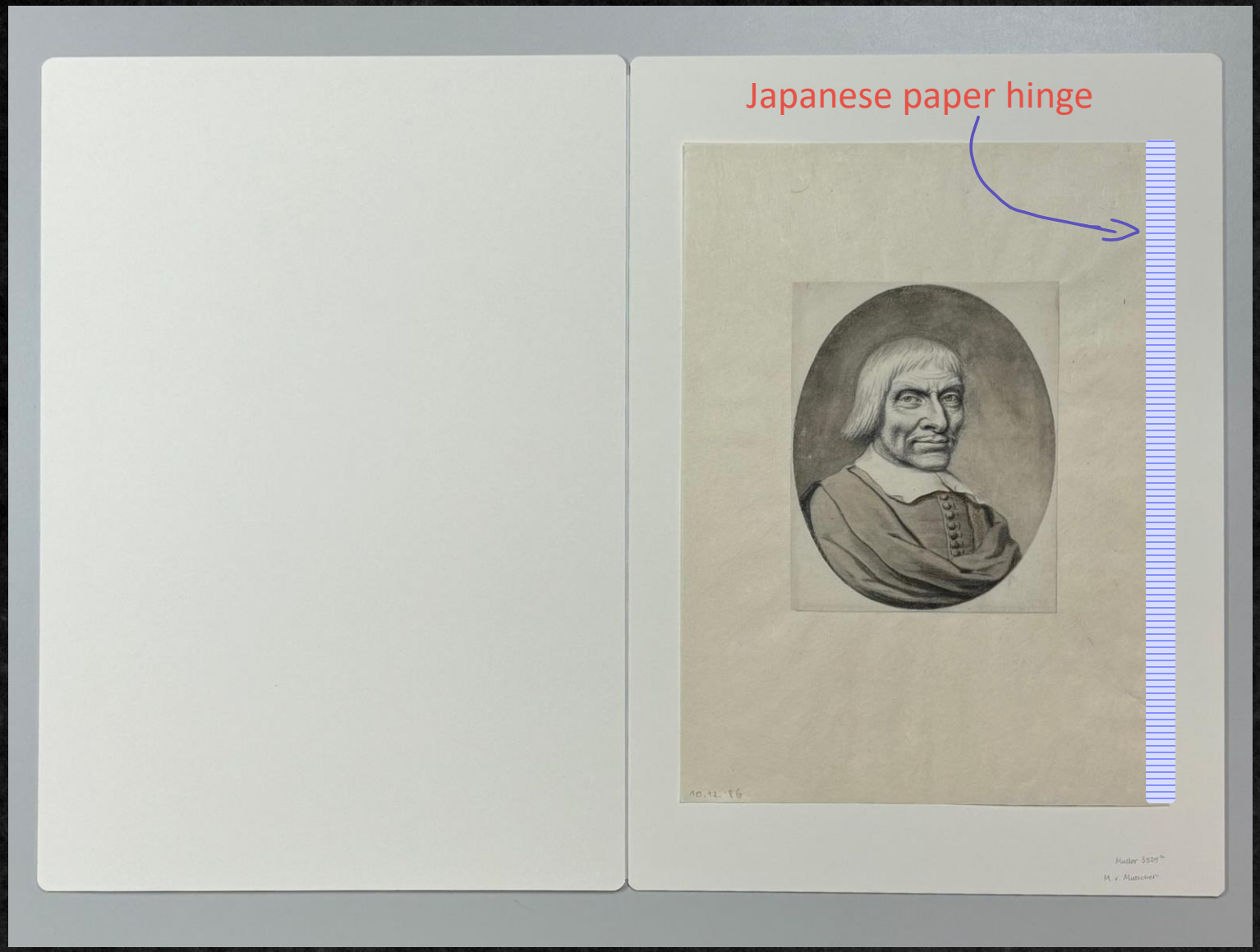
Japanese paper hinge

Japanese paper margins

Inside the folder or passepartout, the drawing is usually mounted on japanese paper margins and hinged on the cardboard along one side

MOUNTING SOLUTION FOR DRAWINGS

Closed folder



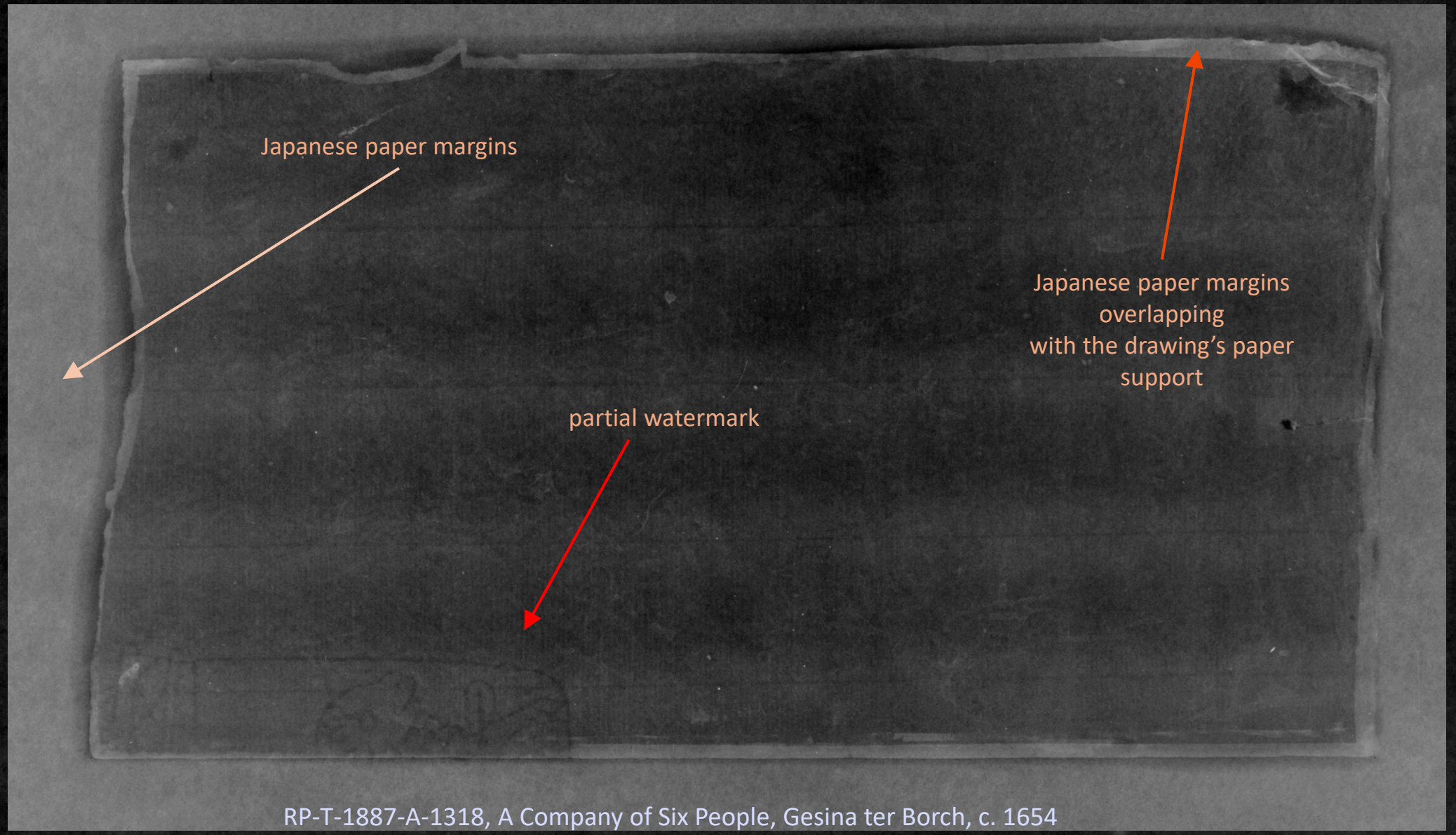
Open folder

LOW-ENERGY X-RAYS: THE PROCESS

LOW-ENERGY X-RAYS: THE SETTINGS

Distance from the source (cm)	mA	kV	seconds
55	3,6	6	240
70	4,2	7	240
70	4,8	8	240

LOW-ENERGY X-RAYS: THE RESULTS

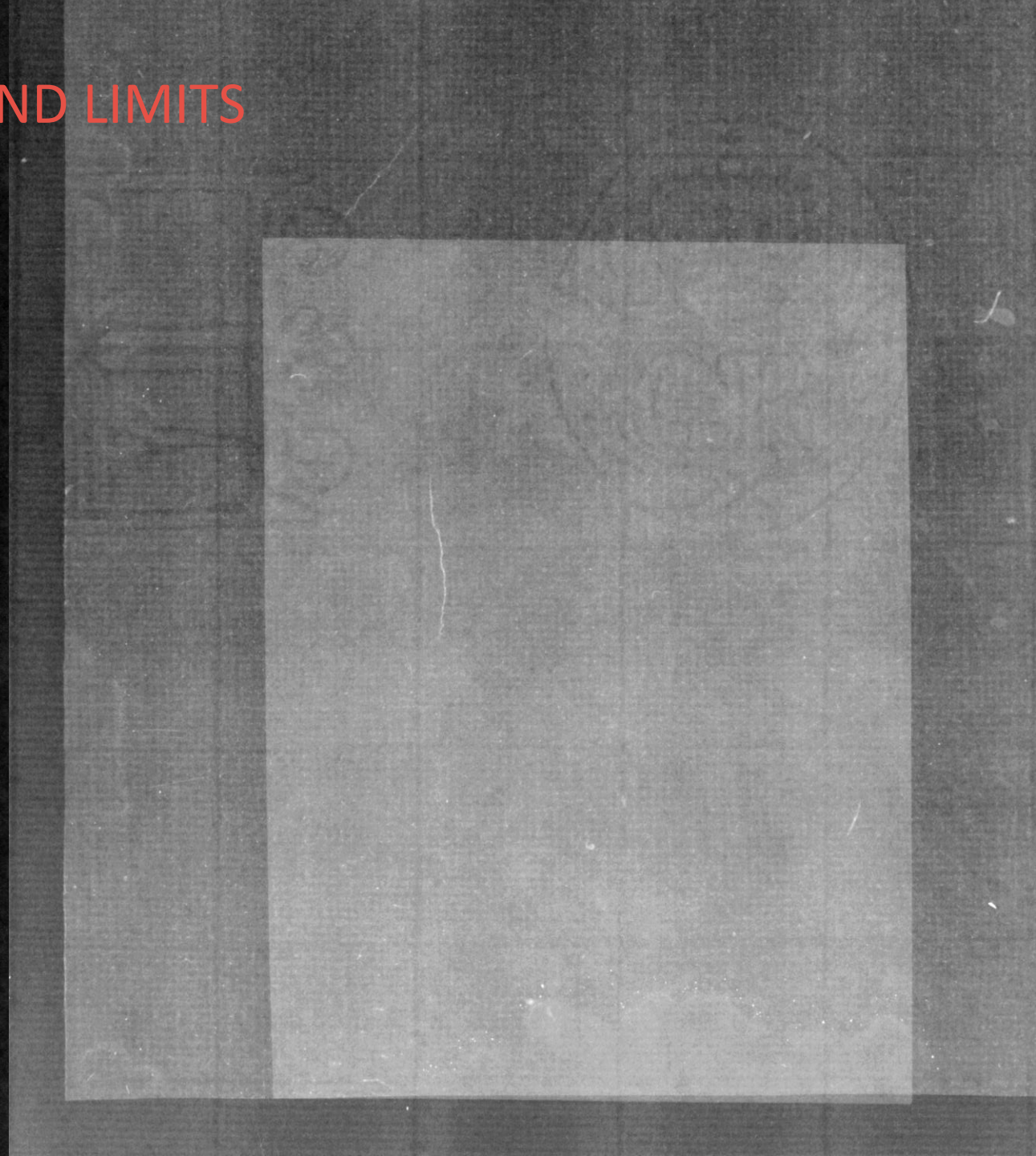


RP-T-1887-A-1318, A Company of Six People, Gesina ter Borch, c. 1654

LOW-ENERGY X-RAYS: CHALLENGES AND LIMITS

Multiple layers of paper

- ***crossing*** chain and laid lines
- ***overlapping*** chain and laid lines
- backing paper support structure prevailing visually over the main sheet of the drawing



LOW-ENERGY X-RAYS: CHALLENGES AND LIMITS

use of *metallic ink*

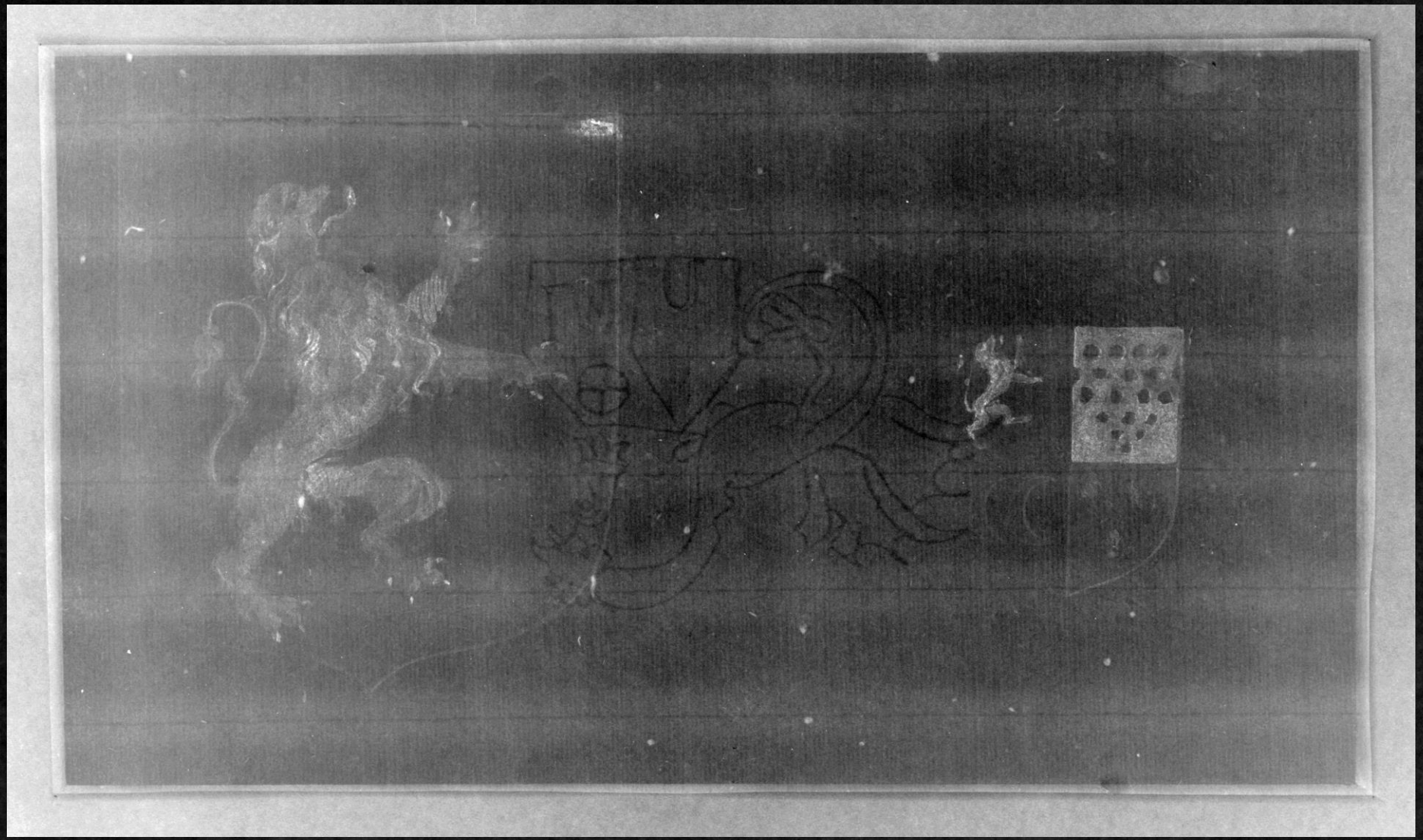
and/or

thick layers of pigments

The X-rays are fully
or partially blocked

RP-T-1879-A-15
Flowers in a Bottle
Dirck de Bray, 1674-06-02

FILE NAMING GUIDELINES

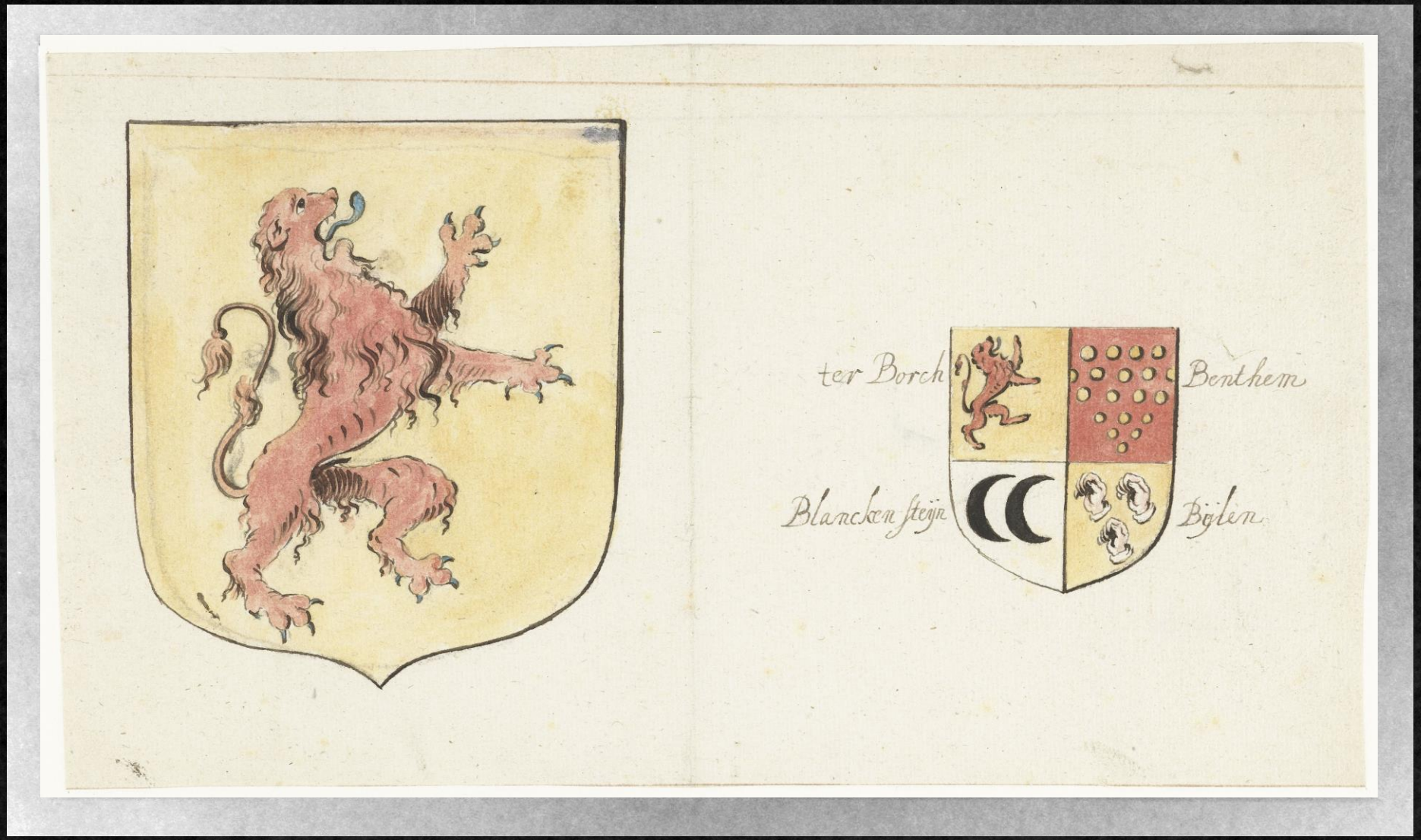


Object number

RP-T-00-64_WM_grenz_full

WM= watermerken
Grenz= name of the technique
Full= if the image shows the full sheet

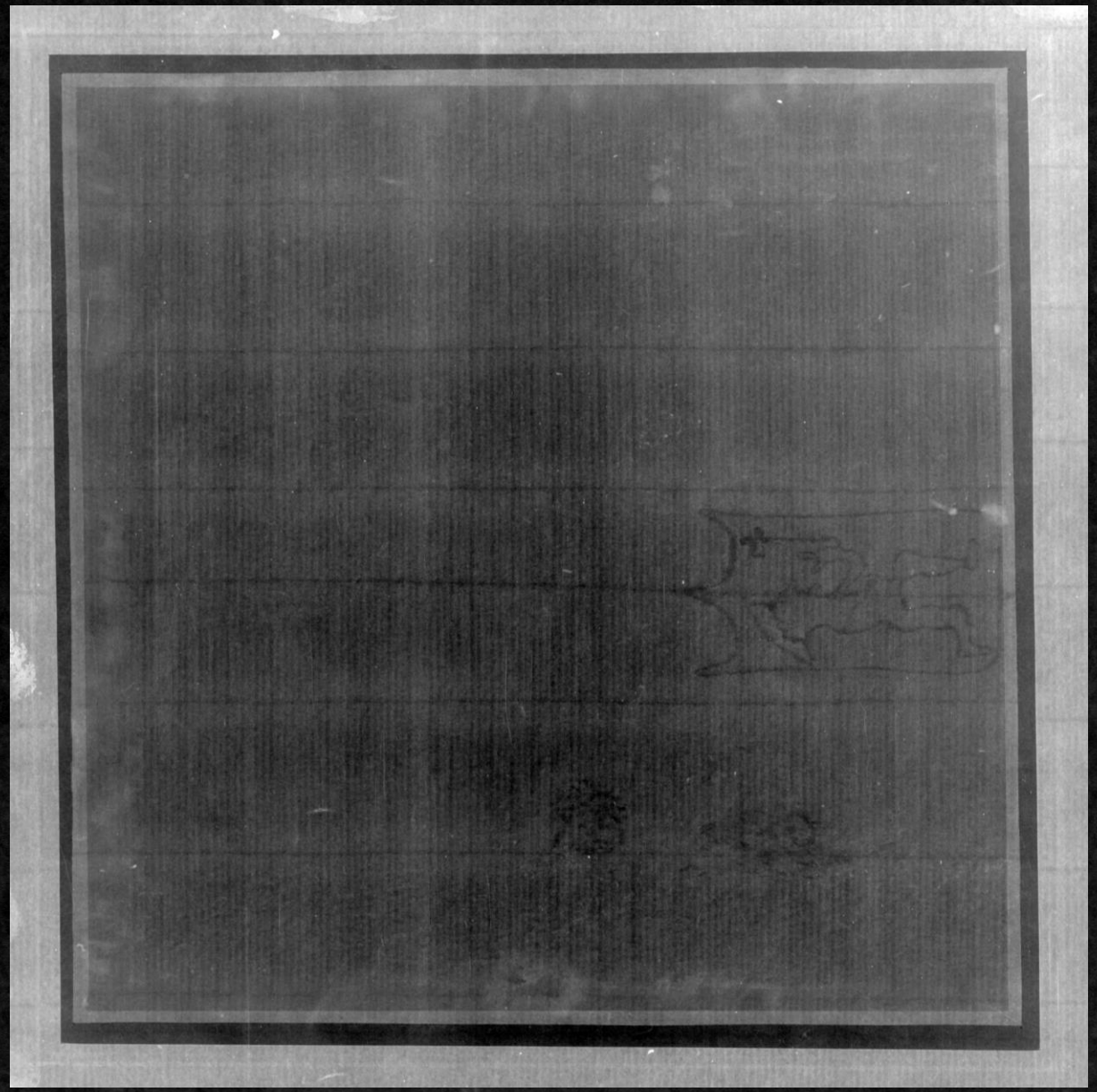
EDITING THE DIGITAL IMAGES



RP-T-00-64
Two coats of arms, Gesina ter Borch, c. 1660 - c. 1669

Minimal editing criteria:

- Keeping the drawings orientation
- Cropping the surrounding japanese paper margins
- Minimal adjustment of the values for better contrast and clarity of the details

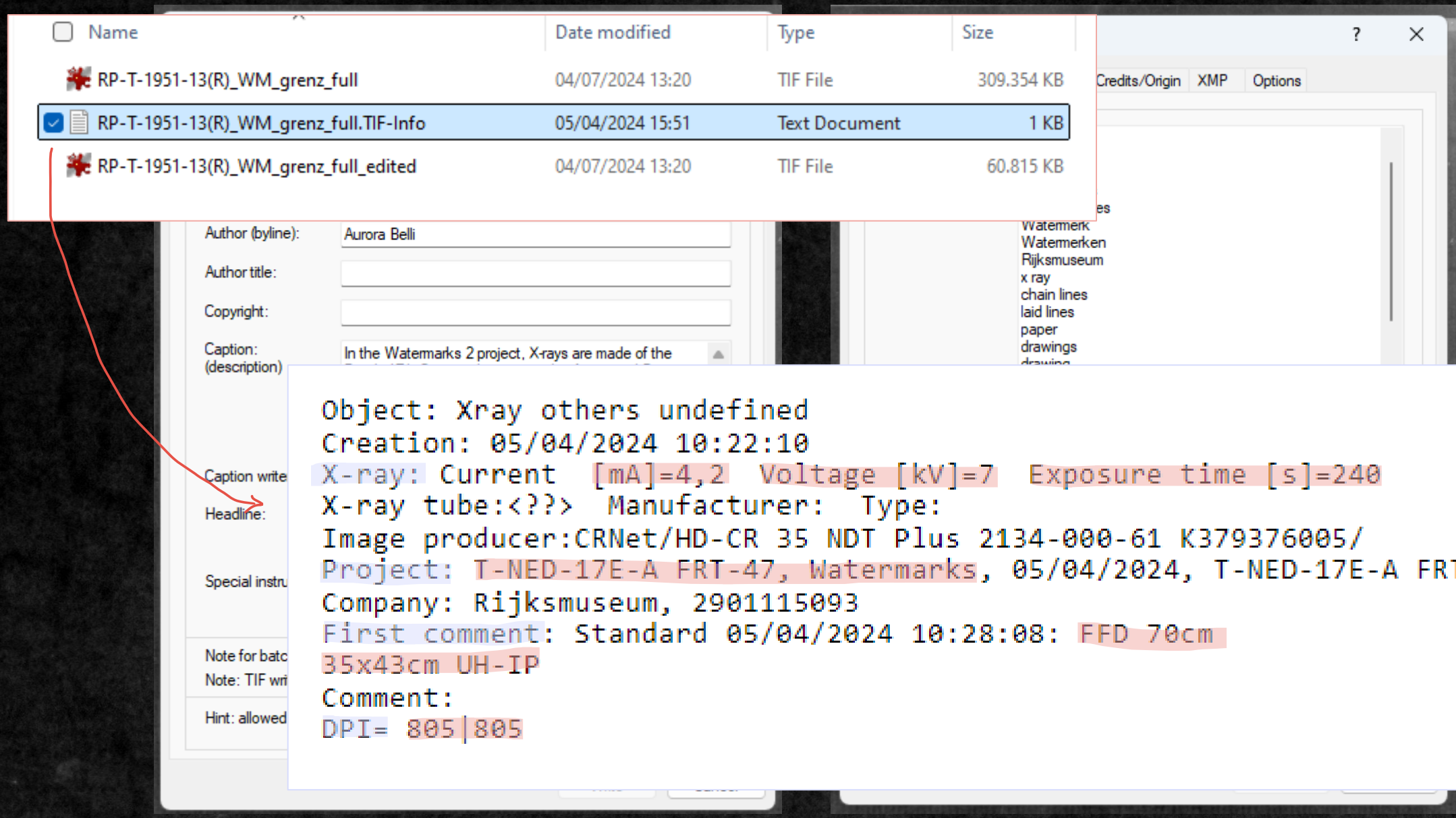


RP-T-1951-13(R)

Baths of Trajan, Bartholomeus Breenbergh, 1625 - pen and brush in brown, h 198mm × b 198mm

Metadata with project details are embedded into each image

.readme file with parameters of acquisition


Name
Date modified
Type
Size
RP-T-1951-13(R)_WM_grenz_full
04/07/2024 13:20
TIF File
309.354 KB
RP-T-1951-13(R)_WM_grenz_full.TIF-Info
05/04/2024 15:51
Text Document
1 KB
RP-T-1951-13(R)_WM_grenz_full_edited
04/07/2024 13:20
TIF File
60.815 KB
Credits/Origin
XMP
Options
Author (byline):
Aurora Belli
Author title:
Copyright:
Caption: (description)
In the Watermarks 2 project, X-rays are made of the
Caption write
Headline:
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Note for batc
Note: TIF wri
Hint: allowed
Watermerk
Watermerken
Rijksmuseum
x ray
chain lines
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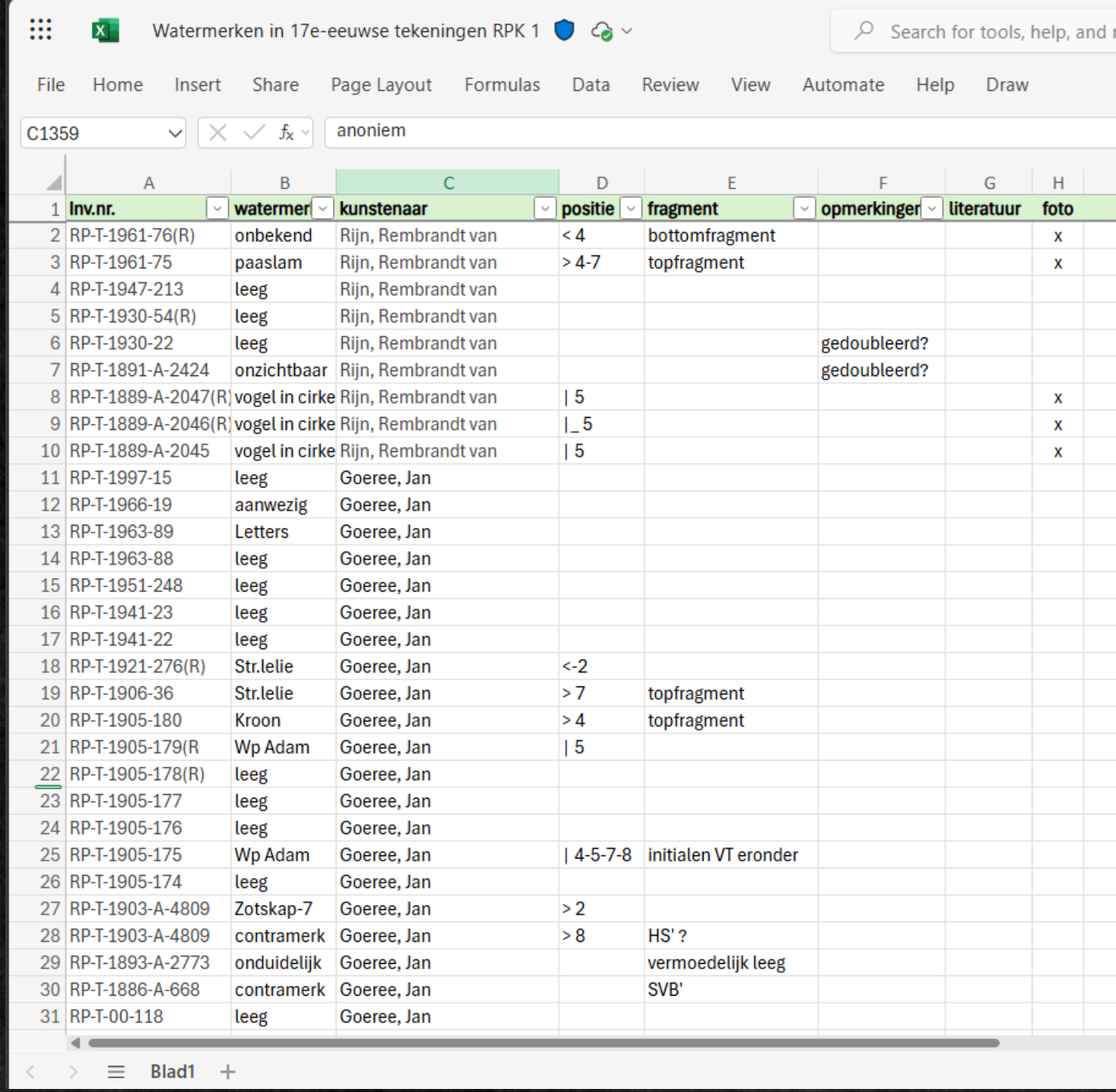
paper
drawings
Object: Xray others undefined
Creation: 05/04/2024 10:22:10
X-ray: Current [mA]=4,2 Voltage [kV]=7 Exposure time [s]=240
X-ray tube:<??> Manufacturer: Type:
Image producer:CRNet/HD-CR 35 NDT Plus 2134-000-61 K379376005/
Project: T-NED-17E-A FRT-47, Watermarks, 05/04/2024, T-NED-17E-A FRT-47
Company: Rijksmuseum, 2901115093
First comment: Standard 05/04/2024 10:28:08: FFD 70cm
35x43cm UH-IP
Comment:
DPI= 805 805

A FIRST LOOK: WATERMARKS IN THE COLLECTION

Parameters:

- Inventory Number
- Type of watermark
- Artist
- Location of the watermark on the sheet
- If a fragment, which part
- Comments
- Literature
- Photo

by Erik Hinterding



Watermerken in 17e-eeuwse tekeningen RPK 1

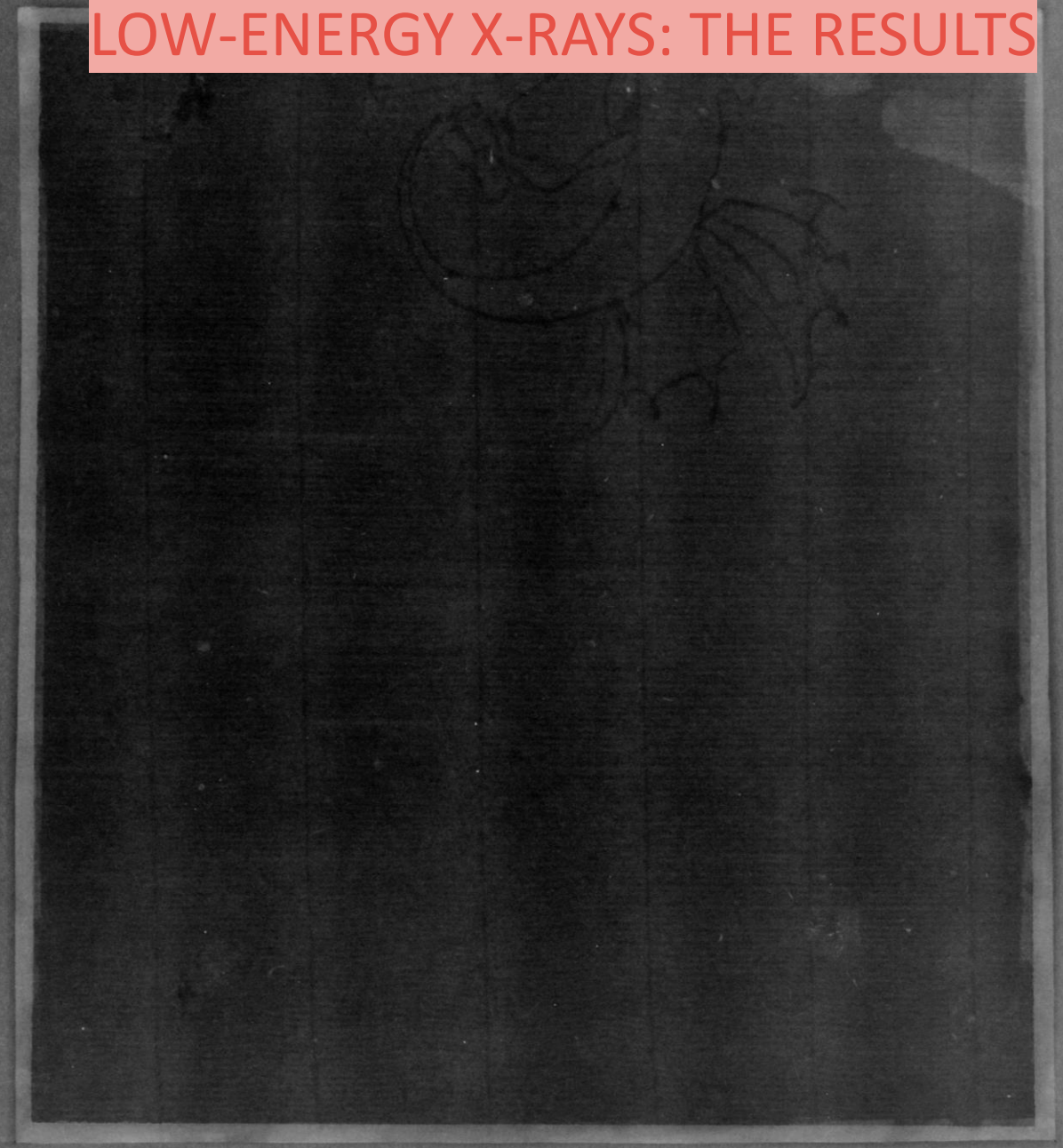
File Home Insert Share Page Layout Formulas Data Review View Automate Help Draw

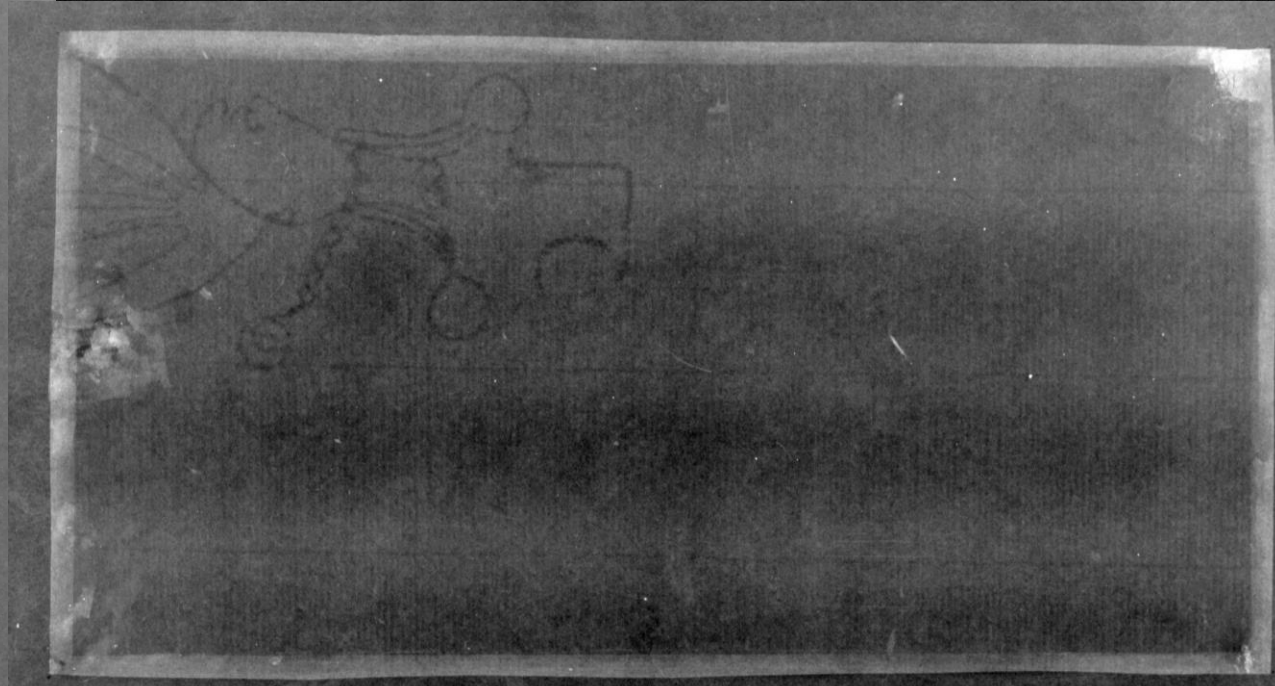
C1359 anoniem

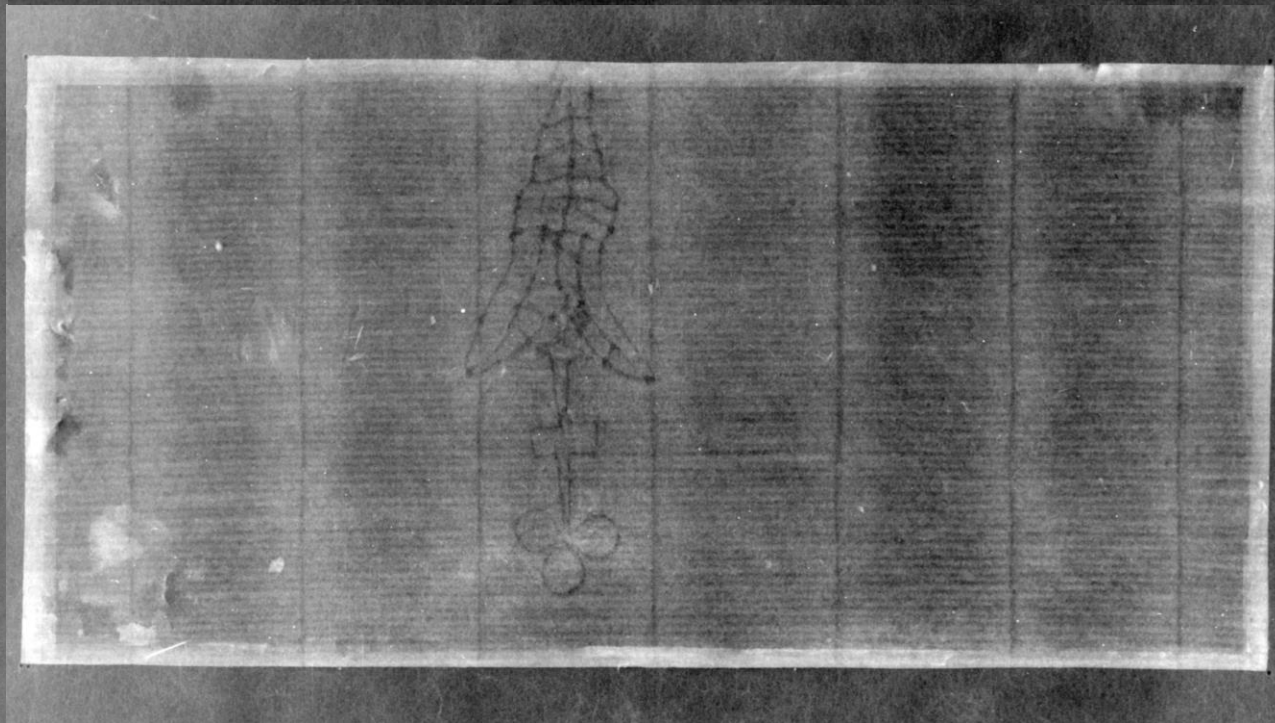
	A	B	C	D	E	F	G	H
1	Inv.nr.	watermer	kunstenaar	positie	fragment	opmerkinger	literatuur	foto
2	RP-T-1961-76(R)	onbekend	Rijn, Rembrandt van	< 4	bottomfragment			x
3	RP-T-1961-75	paaslam	Rijn, Rembrandt van	> 4-7	topfragment			x
4	RP-T-1947-213	leeg	Rijn, Rembrandt van					
5	RP-T-1930-54(R)	leeg	Rijn, Rembrandt van					
6	RP-T-1930-22	leeg	Rijn, Rembrandt van			gedoubleerd?		
7	RP-T-1891-A-2424	onzichtbaar	Rijn, Rembrandt van			gedoubleerd?		
8	RP-T-1889-A-2047(R)	vogel in cirke	Rijn, Rembrandt van	| 5				x
9	RP-T-1889-A-2046(R)	vogel in cirke	Rijn, Rembrandt van	|_ 5				x
10	RP-T-1889-A-2045	vogel in cirke	Rijn, Rembrandt van	| 5				x
11	RP-T-1997-15	leeg	Goeree, Jan					
12	RP-T-1966-19	aanwezig	Goeree, Jan					
13	RP-T-1963-89	Letters	Goeree, Jan					
14	RP-T-1963-88	leeg	Goeree, Jan					
15	RP-T-1951-248	leeg	Goeree, Jan					
16	RP-T-1941-23	leeg	Goeree, Jan					
17	RP-T-1941-22	leeg	Goeree, Jan					
18	RP-T-1921-276(R)	Str.lelie	Goeree, Jan	<-2				
19	RP-T-1906-36	Str.lelie	Goeree, Jan	> 7	topfragment			
20	RP-T-1905-180	Kroon	Goeree, Jan	> 4	topfragment			
21	RP-T-1905-179(R	Wp Adam	Goeree, Jan	| 5				
22	RP-T-1905-178(R)	leeg	Goeree, Jan					
23	RP-T-1905-177	leeg	Goeree, Jan					
24	RP-T-1905-176	leeg	Goeree, Jan					
25	RP-T-1905-175	Wp Adam	Goeree, Jan	| 4-5-7-8	initialen VT eronder			
26	RP-T-1905-174	leeg	Goeree, Jan					
27	RP-T-1903-A-4809	Zotskap-7	Goeree, Jan	> 2				
28	RP-T-1903-A-4809	contramerk	Goeree, Jan	> 8	HS' ?			
29	RP-T-1893-A-2773	onduidelijk	Goeree, Jan		vermoedelijk leeg			
30	RP-T-1886-A-668	contramerk	Goeree, Jan		SVB'			
31	RP-T-00-118	leeg	Goeree, Jan					

Blad1

LOW-ENERGY X-RAYS: THE RESULTS



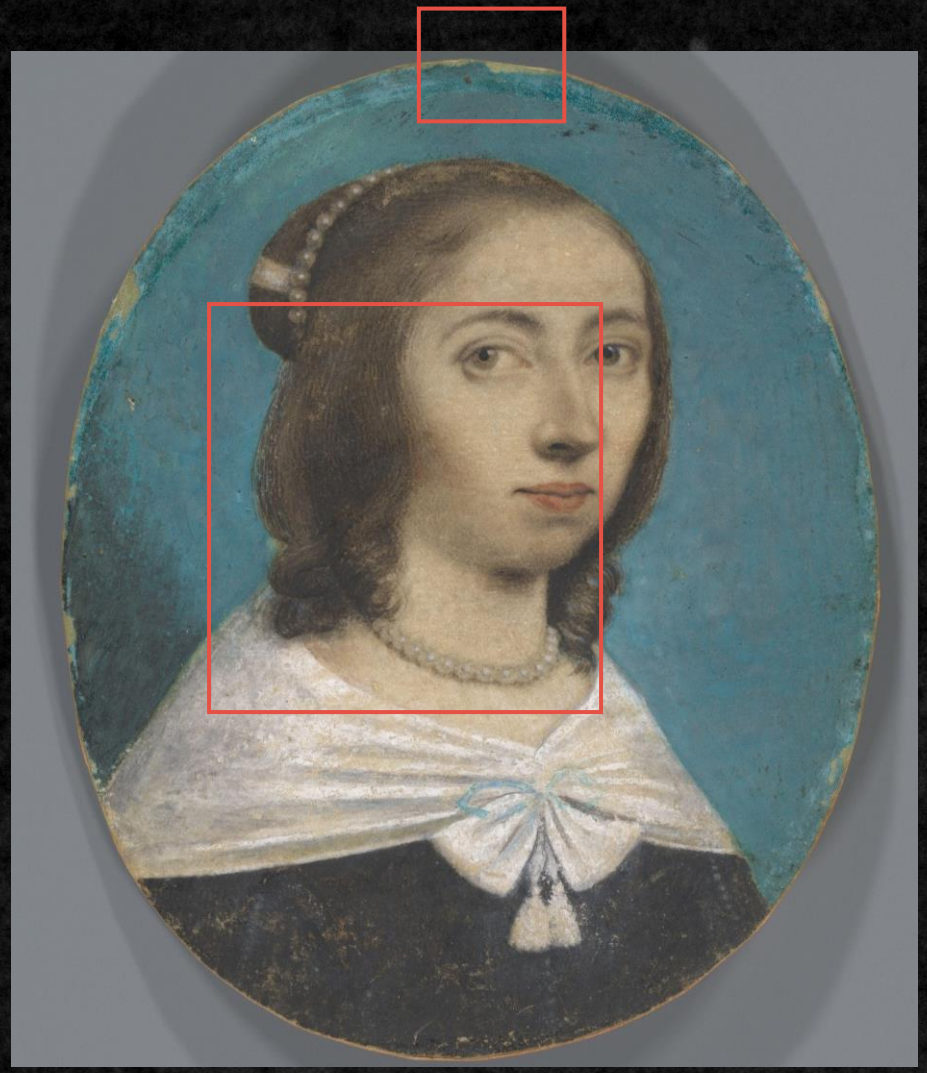




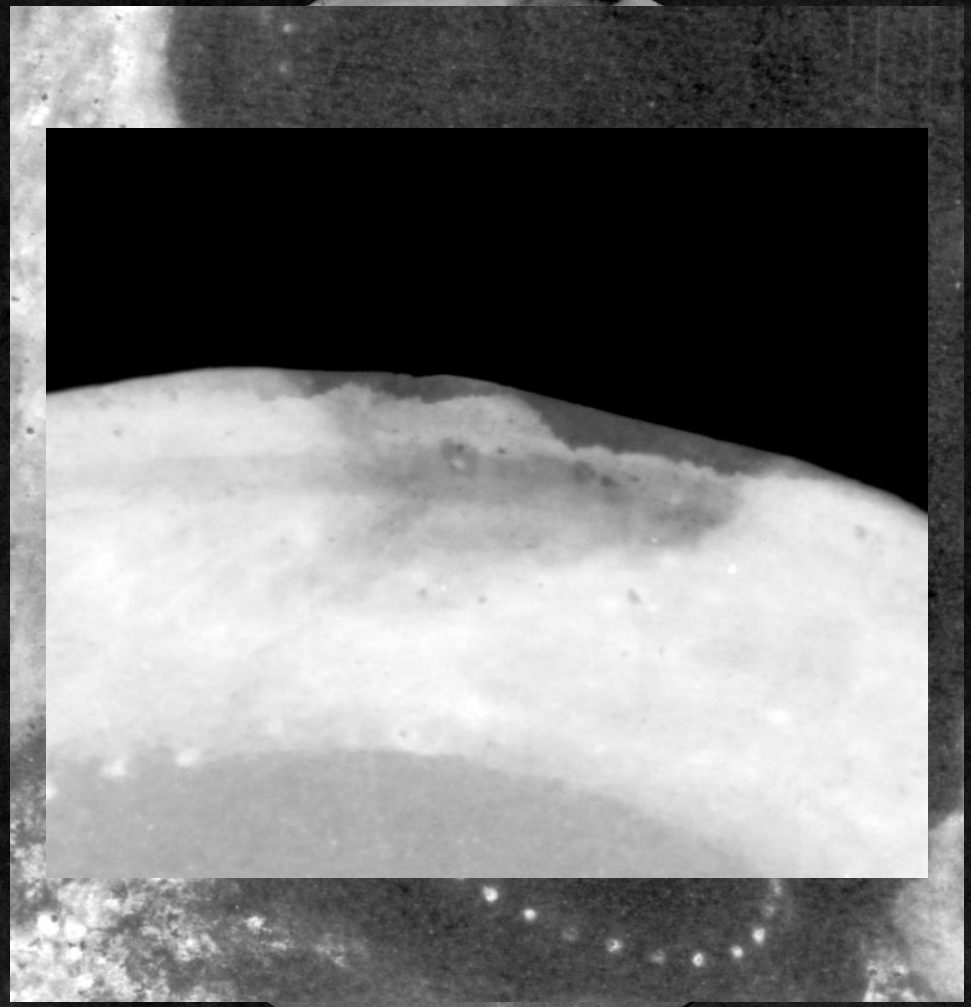
RESEARCH

Disentangling the nar
Wereldmuseum Rotte

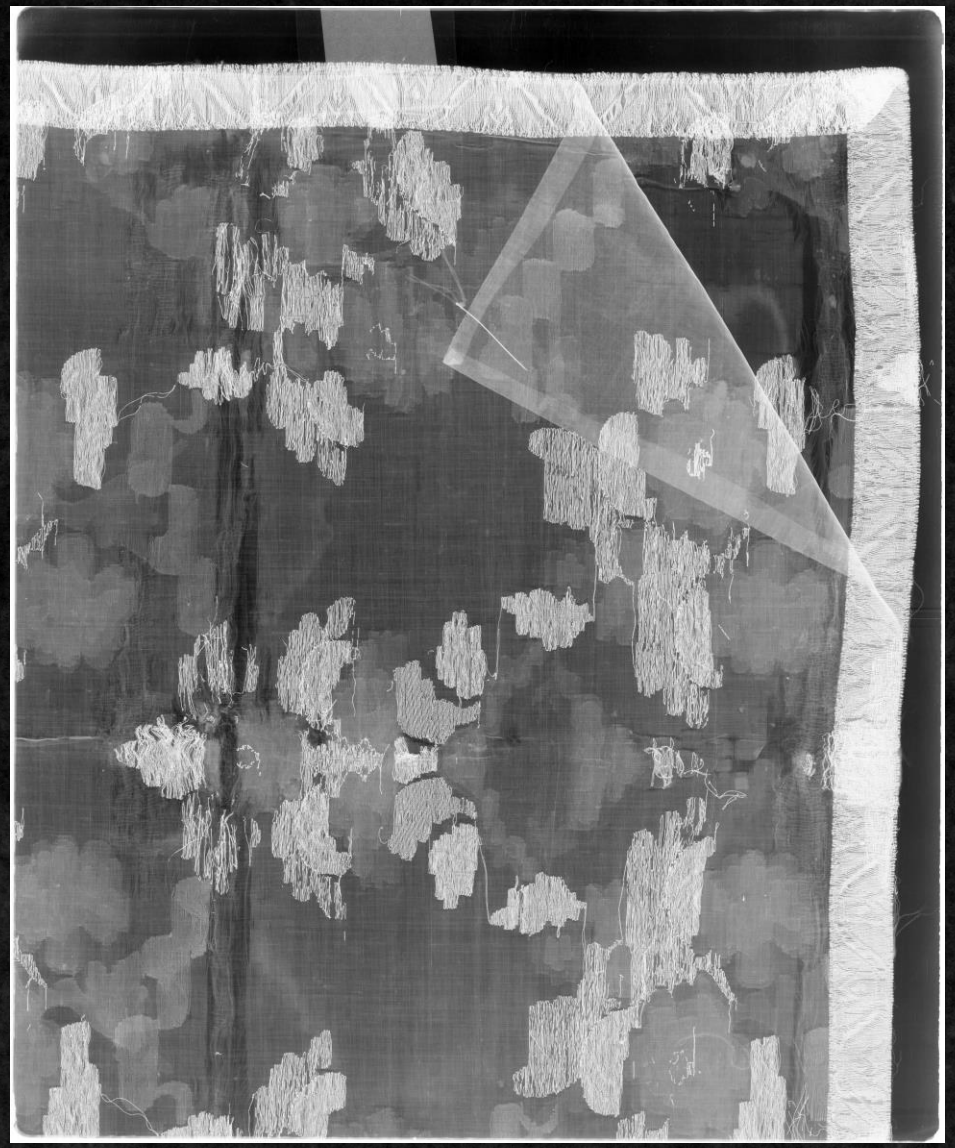
RESEARCH REQUESTS

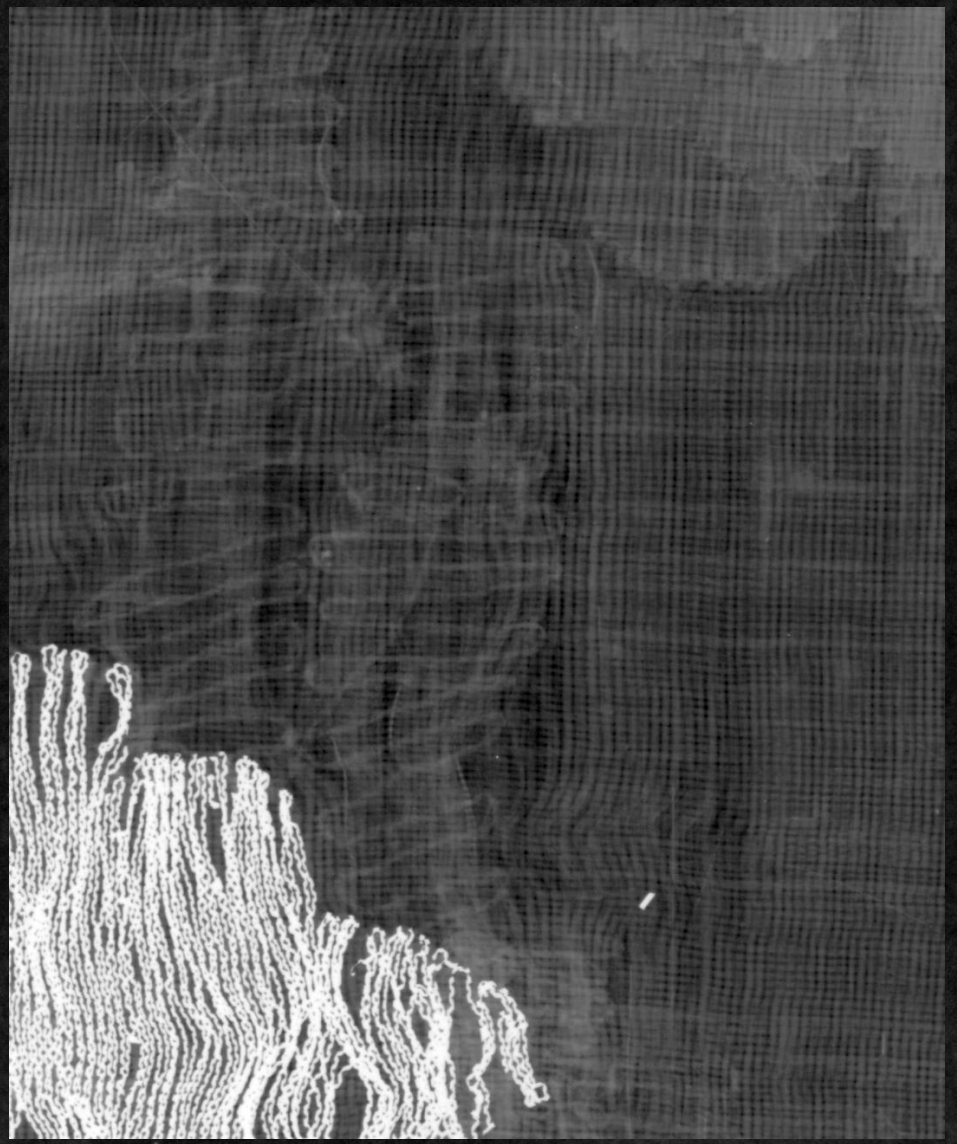


NG-2018-302
Portrait of a woman, possibly Anna Maria van Schurman
Painting on parchment



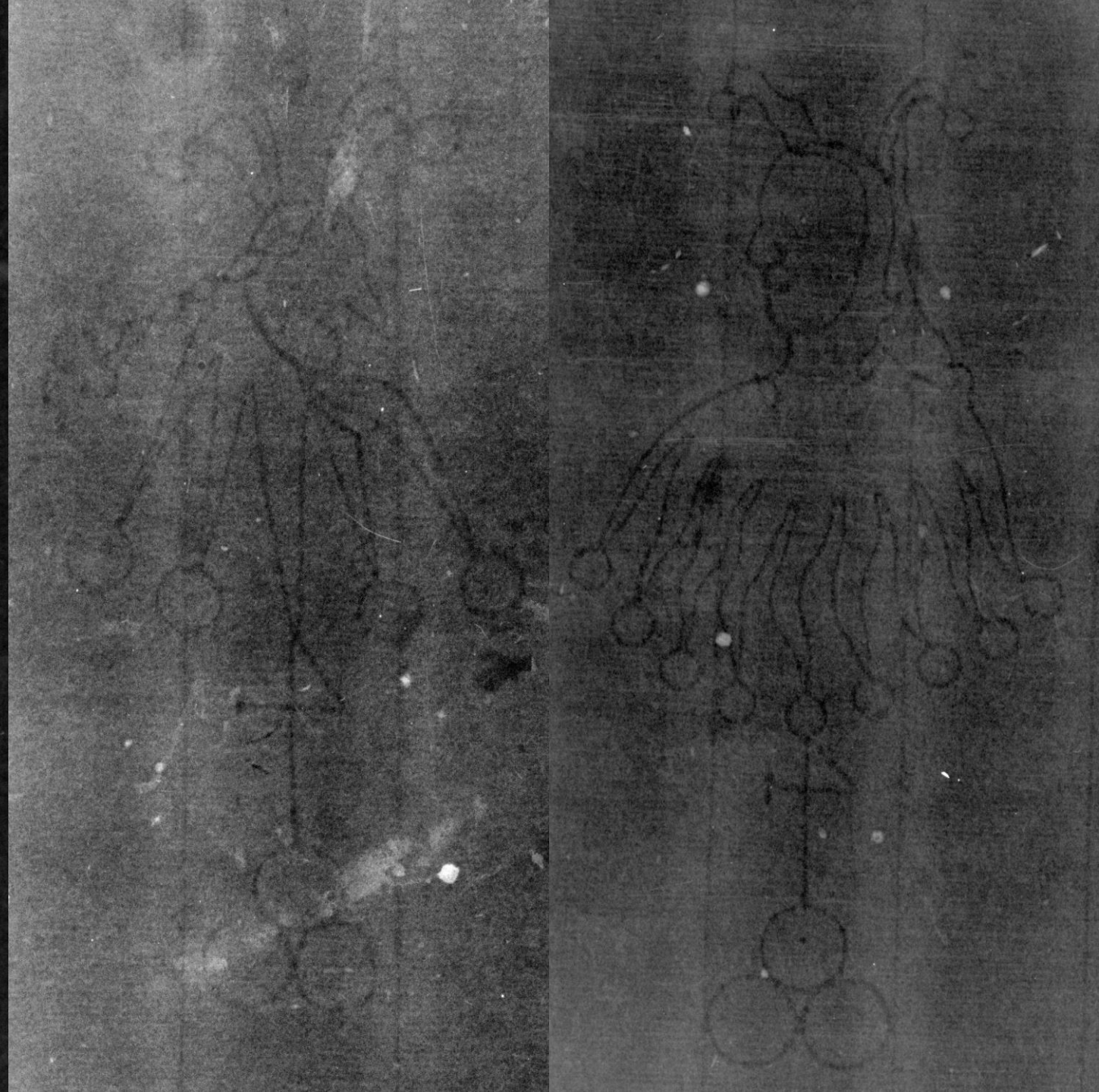
RESEARCH REQUESTS





WHAT'S NEXT?

- Completing the imaging campaign by the end of 2025
- Sharing our results with colleagues
- Uploading the material freely on the Rijksstudio Website
- Adding layers to interact with the image (scalebar, notes,…)
- Implementing the use of *AI* and *Machine Learning* to recognise, compare and organise the database



Thanks for your kind attention ☺

This project was made possible by the ***Van Marle Foundation / Rijksmuseum fund***

A special thank goes to all the colleagues involved in the project