

REMBRANDT'S „OLD WOMAN PRAYING“ – A LOOK BELOW THE SURFACE USING MA-XRF

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Introduction

X-ray fluorescence analysis (XRF), which enables non-destructive measurements, has become one of the most established methods in the analysis of cultural heritage. Recent developments around the XRF instruments have made the *in situ* use increasingly possible, even in the field of MA-XRF. In a cooperation with the company XGLab the ELIO system was used for the analysis of the *Old Woman Praying*.



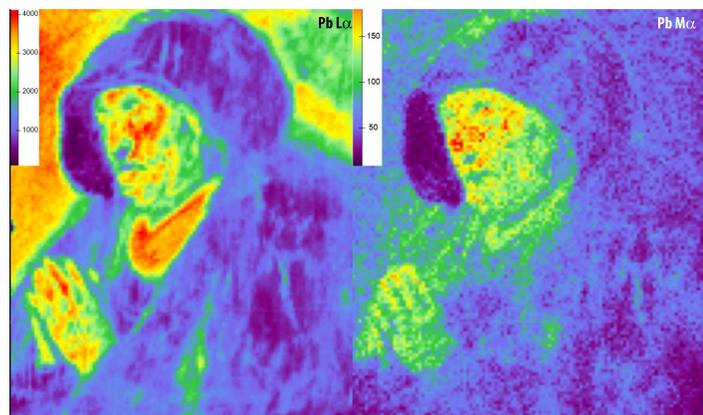
Rembrandt, *Old Woman Praying*
15,5 x 12,2 cm

Rembrandt's painting *Old Woman Praying*, 1629/30, is the most valuable picture in the Dutch section of the exhibition in the Residenzgalerie Salzburg (RGS). It belongs to a series of three small-scale tronies all painted on a gilded copper plate (the others are: *The Laughing Man* from the Mauritshuis, The Hague, and the *Self Portrait* from the National Museum, Stockholm). This extremely unusual painting support is a special feature both in Rembrandt's work and in the entire history of art.

A surface sample of *The Laughing Man* had previously been analysed, showing a layer of lead white directly on the copper plate, and the gold film applied over it. Microscopic examinations led to the same conclusion for the *Self Portrait*.

Examinations

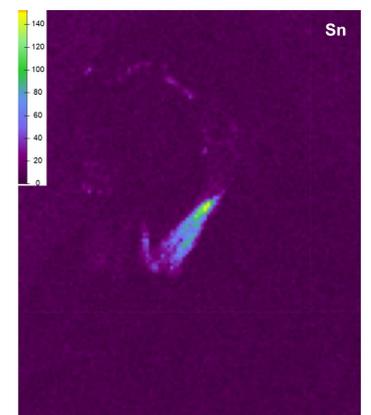
Lead distribution



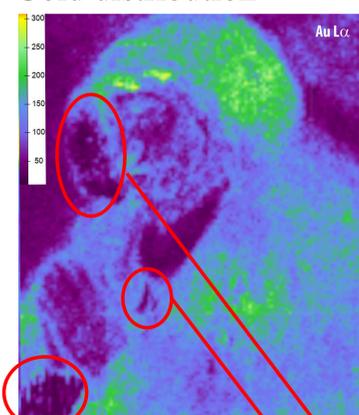
The Pb M_{α} distribution (originating from a lesser depth) only partly overlaps with the Pb L_{α} distribution (originating from a greater depth). The M_{α} line relates to areas of flesh tones, a few lighter shadings and the neckscarf. The signals indicate the use of lead white in these areas with one exception: the neckscarf. Here the tin distribution shows a clear overlap, showing the use of (also) lead tin yellow.

The Pb L_{α} signals are found additionally in the background, originating from a preparatory paintwork (underpainting) containing lead white.

Tin distribution



Gold distribution



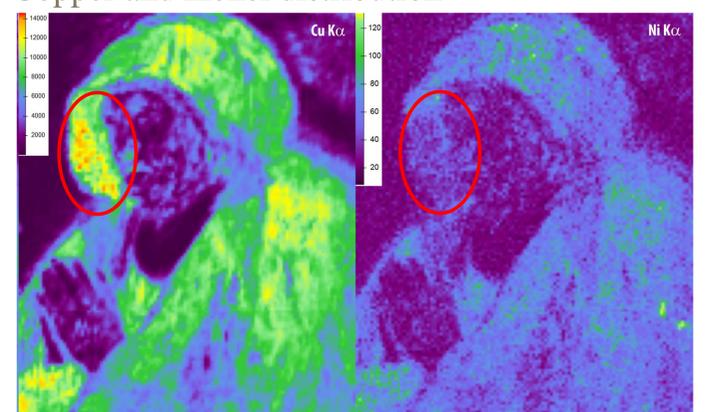
Gold cannot be detected in the areas where large quantities of a lead containing pigment are present on top. As the gold signal is inhibited by the lead white underpainting, the thin gold foil must be underneath this layer. **Consequently, the gold has been applied directly on the copper plate, presumably using oil gilding, in contrast to the two other small-scale tronies.**

Other areas in which no gold signal could be detected, are indicated in the Au-map. No later changes in the paint layers are apparent in these areas, therefore, it seems that these are effects intended by Rembrandt.

The reason for the lack of gold in the lower left corner is not clear – there are no artistic or structural indications.

The effect in these areas looks completely intentional, as the areas without gold coincide nicely with the dark shadows. The gold was presumably scratched off from this part to achieve a darker colour effect.

Copper and nickel distribution



Copper (from the copper plate) can be detected in all areas where no lead white inhibits the signal. The nickel distribution coincides with the copper indicating it as component of the copper plate alloy. An exception is the area of shadow within the hood, where the gold was removed. Here the concentration of copper is highest, whereas nearly no nickel is present. This indicates the use of azurite in the uppermost layer.

Conclusions

These investigations led to the conclusion that the layering of the *Old woman praying* is clearly different to *The Laughing Man* and the *Self Portrait*. Additionally, there are three gaps in the gold layer, giving new insights in the painting technique of Rembrandt. Nevertheless, the gap in the lower left corner is still subject for speculation.

Other pigments found, are: umber, cinnabar, red lake (identified through the presence of calcium), azurite and possibly bone black.

The results of this project were presented in the exhibition *Rembrandt – Beneath the paint* in the RGS from 13.11.2016 – 26.6.2017.*

*G. Groschner, M. Huber, K. Uhlir, *Rembrandt. Beneath the paint*, Domquartier Salzburg GmbH, 2016, ISBN 978-3901443-43-5