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In the 15th and 16th century, a well used technique to create high quality drawings was to draw them with a metalpoint stylus on special paper. The paper for metalpoint drawings was made by adding a preparation layer on its surface, which gave a white ground for the drawing and stiffened the surface. This is necessary to depose a visible amount of metal on the surface of the drawing via a stylus.

In this period drawings and paintings were normally not signed, so that it is very difficult to identify the artist, as there is seldom written proof of his identity. Next to art historical studies comparing the style of artists it is possible to compare the composition of their tools by chemical and physical means. As most objects from the field of cultural heritage analysis are very valuable, the analysis must be destruction free and the time to analyze them is often limited. The need for an accurate, fast and destruction free method with a high spatial resolution to study such pieces of art in detail is best satisfied by synchrotron-based µ-XRF.

Silverpoint styli only leave tiny amounts of silver on the surface of a drawing. So they can be used over a long period without significant attrition. Metalpoint styli were not mass produced making them quiet costly and considerably variable in their composition. It can be assumed that an artist used the same stylus over a long period even though he used different styli to accentuate his drawings [1].

In this experiment, a silverpoint drawing attributed to Rogier van der Weyden was analyzed. The recto and the verso side (see Figure 1) both display young women but show considerable stylistic differences and it is assumed that they were made by different artists. This experiment aimed on answering the question, if both drawings were made with the same silver stylus.

This experiment was done at Beamline L of HASYLAB. The drawing was placed on a two-axis motor stage and was excited with a monochromatic beam of 30 keV with a beamsize of 100 by 100 µm. On both sides various points were chosen and measured for several minutes.

In the spots next to Ag various other elements were found (see Figure 2). While Cu, Ag and Hg can be attributed to the silver stylus, the elements Ca, Fe, Sr and Pb are part of the preparation layer. The Hg found in the silver marks was not in the original stylus. Presumably, Hg from the surrounding of the drawing formed amalgams with the silver over the centuries [2]. Since in this experiment only point measurements were done no information about homogeneity of the silver marks was gained. In further experiments, the spectra of small area mappings will be compared and summed up, to make sure no contamination or hotspot in accidental analyzed.

By comparing the results of the different sides of the drawing with each other and the results of other drawings and working groups the probability that the drawings were done with the same stylus will be calculated thus supporting the attribution of this drawing.

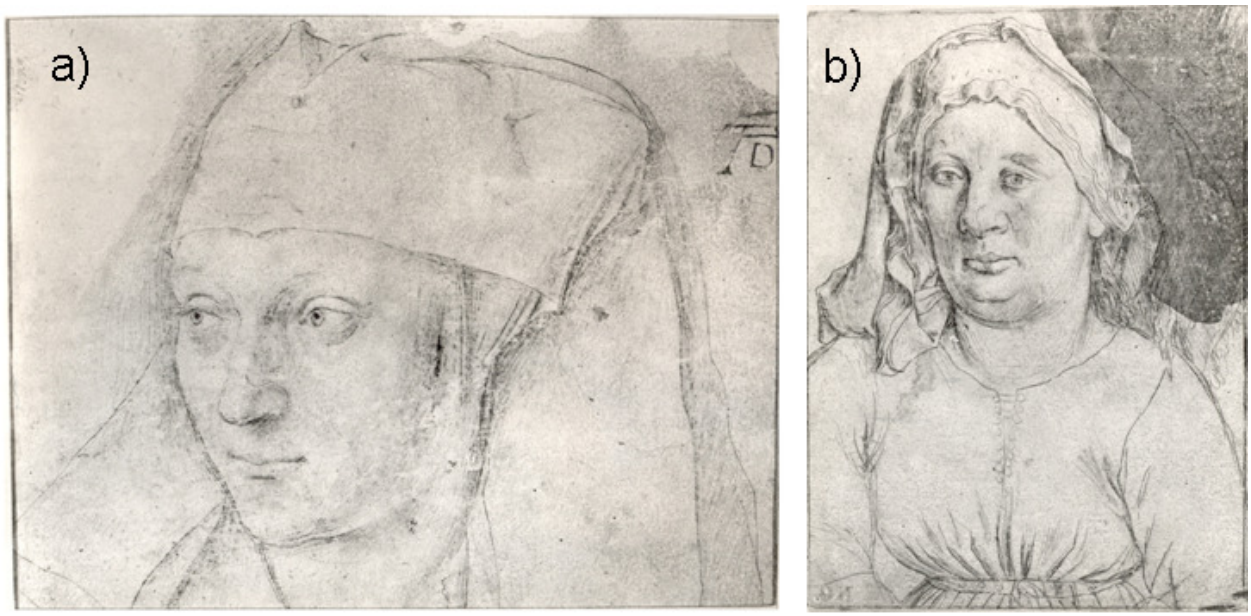

Figure 1: Verso (a) and recto (b) side of the drawing.

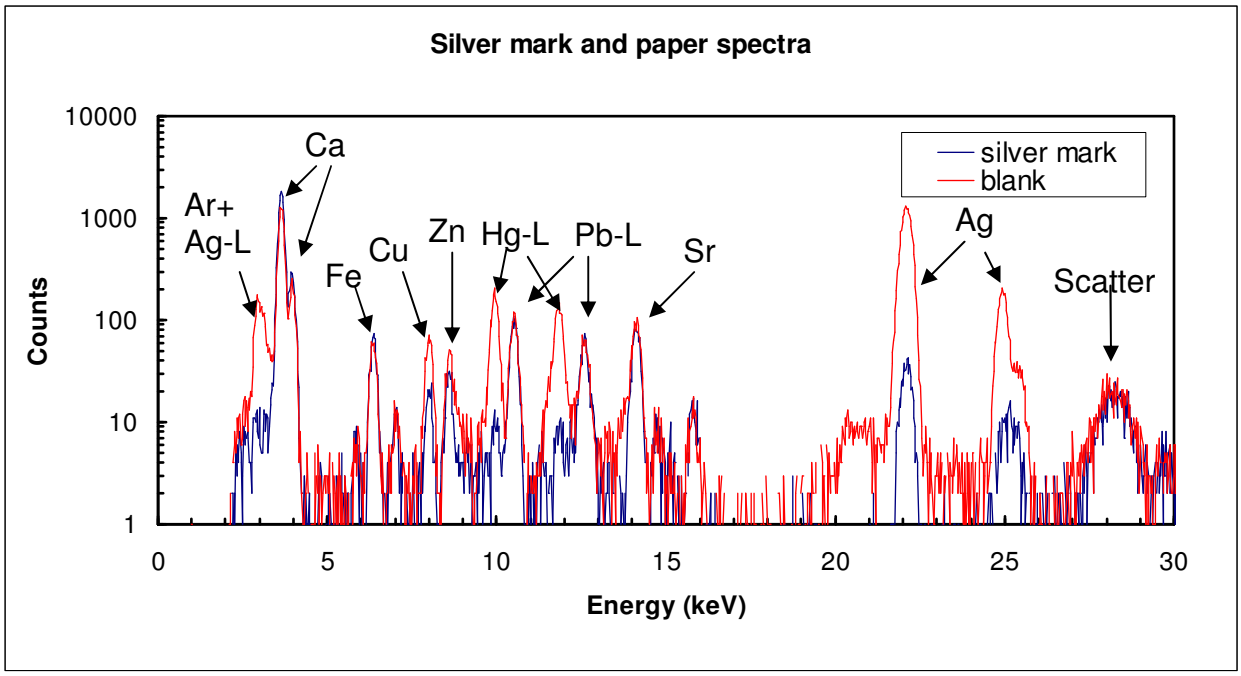

Figure 2: Comparison of two not normalized spectra of a silver mark on the paper and a blank spot.

References

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