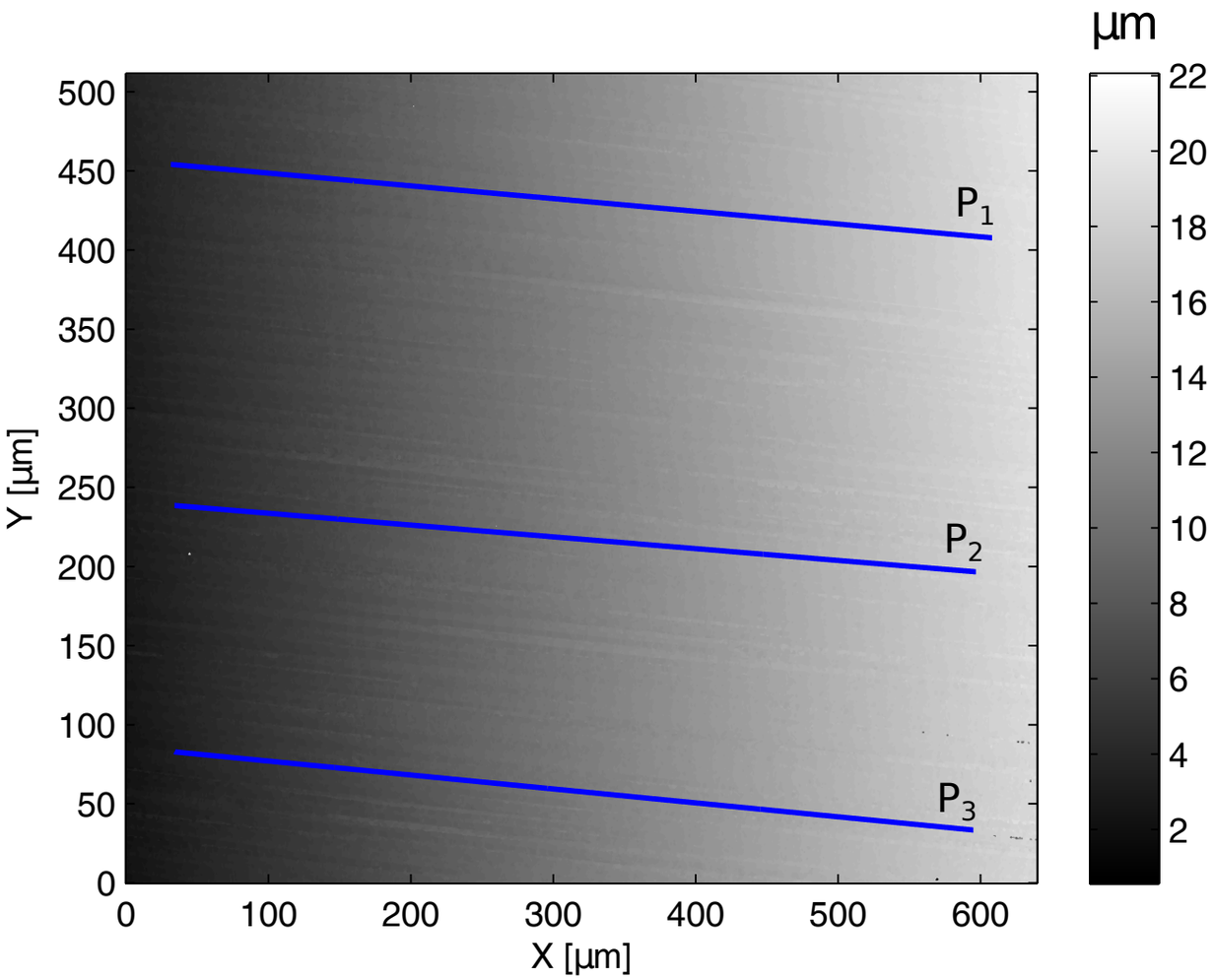
Activity 1: surface characterization

Roughness Standard



6. EXPERIMENTAL RESULTS IN REAL OBJECTS

We used an Olympus BH microscope equipped with a motorized positioning stage, a 10× Mirau type interference objective lens and a Tucsen IS 130 CCD camera. We acquired a WLSI image series with the stage displaced 0.018 μm for each frame.

To validate the proposed method, we used the flat lapping specimen of a Rubert & Co. Ltd roughness comparison set No. 130 with roughness parameter $R_a = 0.05$ μm. We reconstructed a portion of the specimen as shown in Fig 10a. In Fig. 10b we show a profile and its mean line profile along the P_1 direction. We estimated the mean line profile according to the standard ISO/TS 16610-22, and the R_a roughness parameter was calculated by following the standard EN ISO 4287. We obtained R_a values of 0.046 μm, 0.057 μm, and 0.063 μm through the directions P_1, P_2, and P_3 respectively, as shown in Fig. 10a. The average value of $R_a = 0.055$ μm and standard deviation $\sigma = 0.008$ μm, which is quite close to the reference value of $R_a = 0.05$ μm. We also performed the 3D reconstruction via WLSI (see Visualization 3) with maximum intensity detection yielding an average value of $R_a = 0.047$ μm and standard deviation $\sigma = 0.008$ μm. As expected, in this sample of high reflectivity the measurements with both methods agree within the experimental error.

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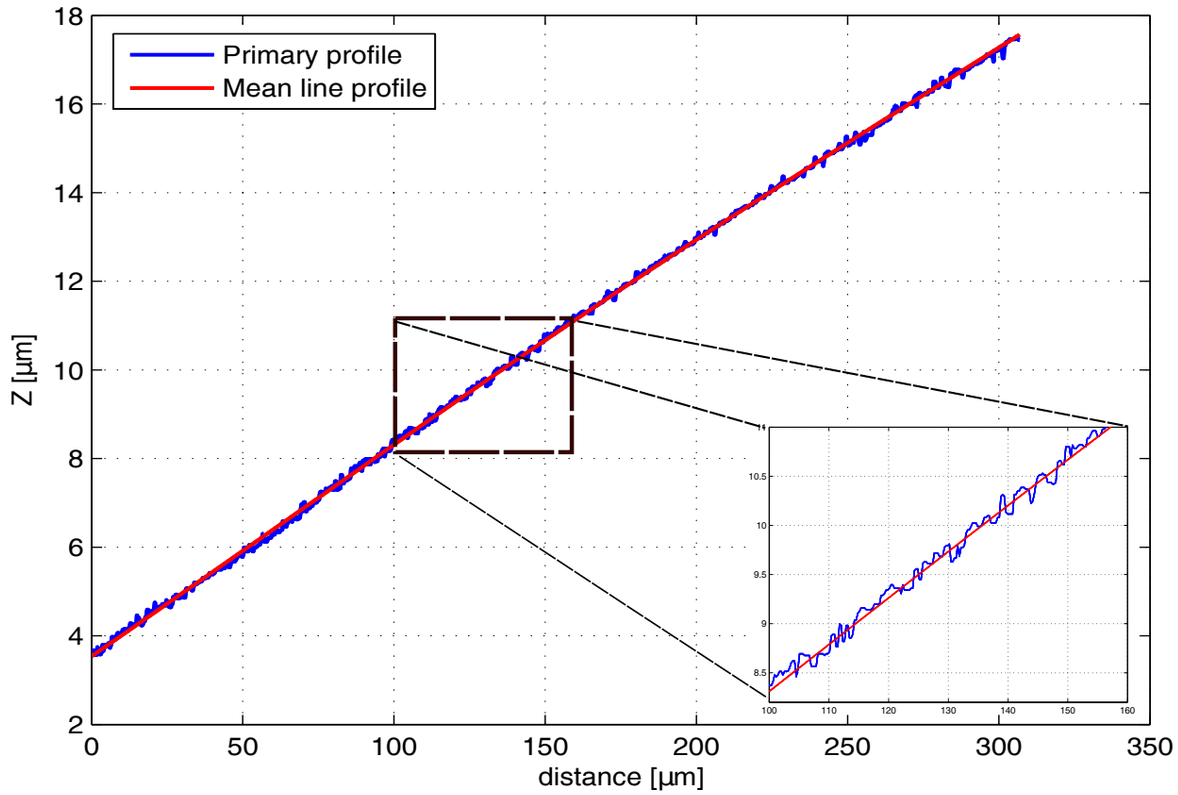

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Activity

1. You will get , find the R_a, R_{rms}, R_p, R_v, and R_t

    1.1. For the line at y = 250μm (plot a graph x vs z @ y = 250μm)

    1.2. For the line at y = 450μm (plot a graph x vs z @ y = 450μm)

    1.3. Whole image (all points)

2. Bonus: find Sa.