*Supplementary Information for the article*

# Removing Interference-based effects from infrared spectra - interference fringes re-revisited

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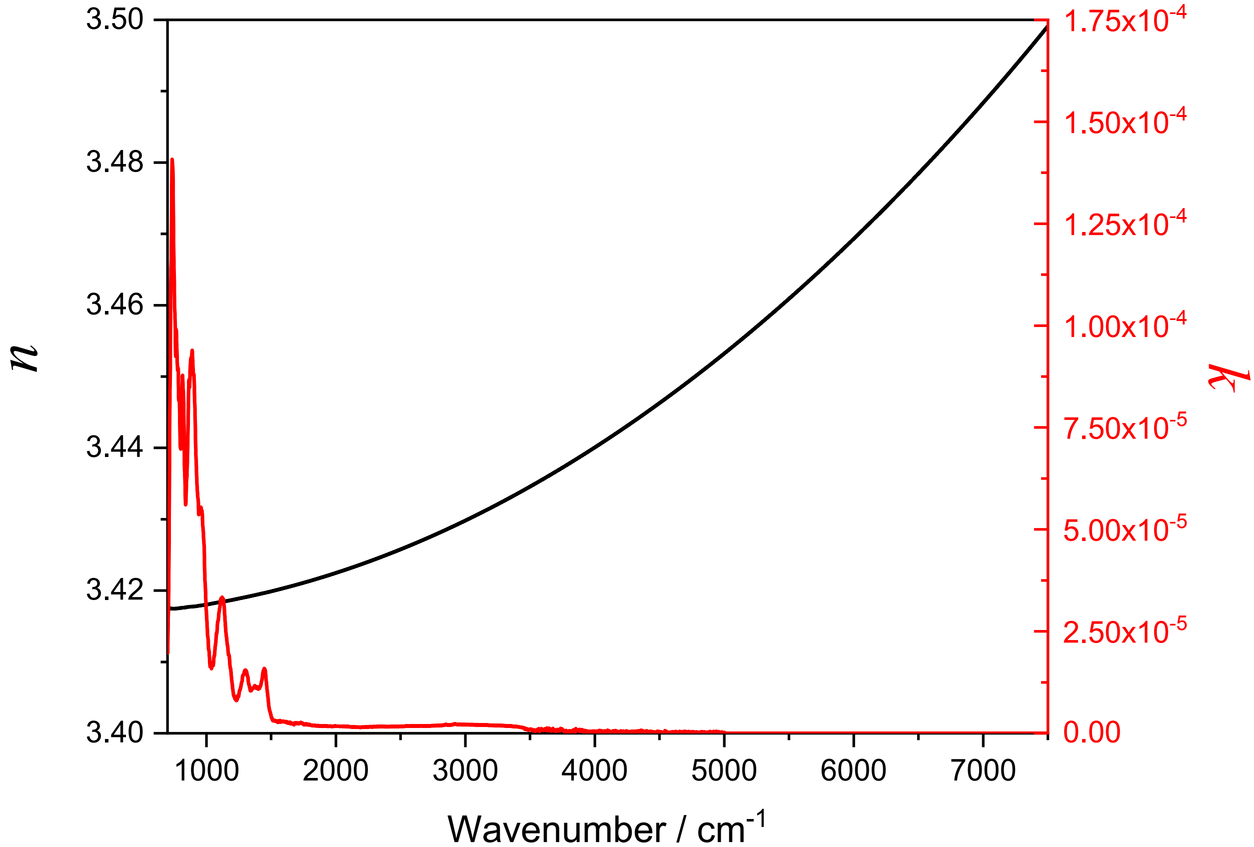


*Figure SI 1:* Optical constants of the uncoated Si substrate as determined by the procedure detailed in section 2.3.

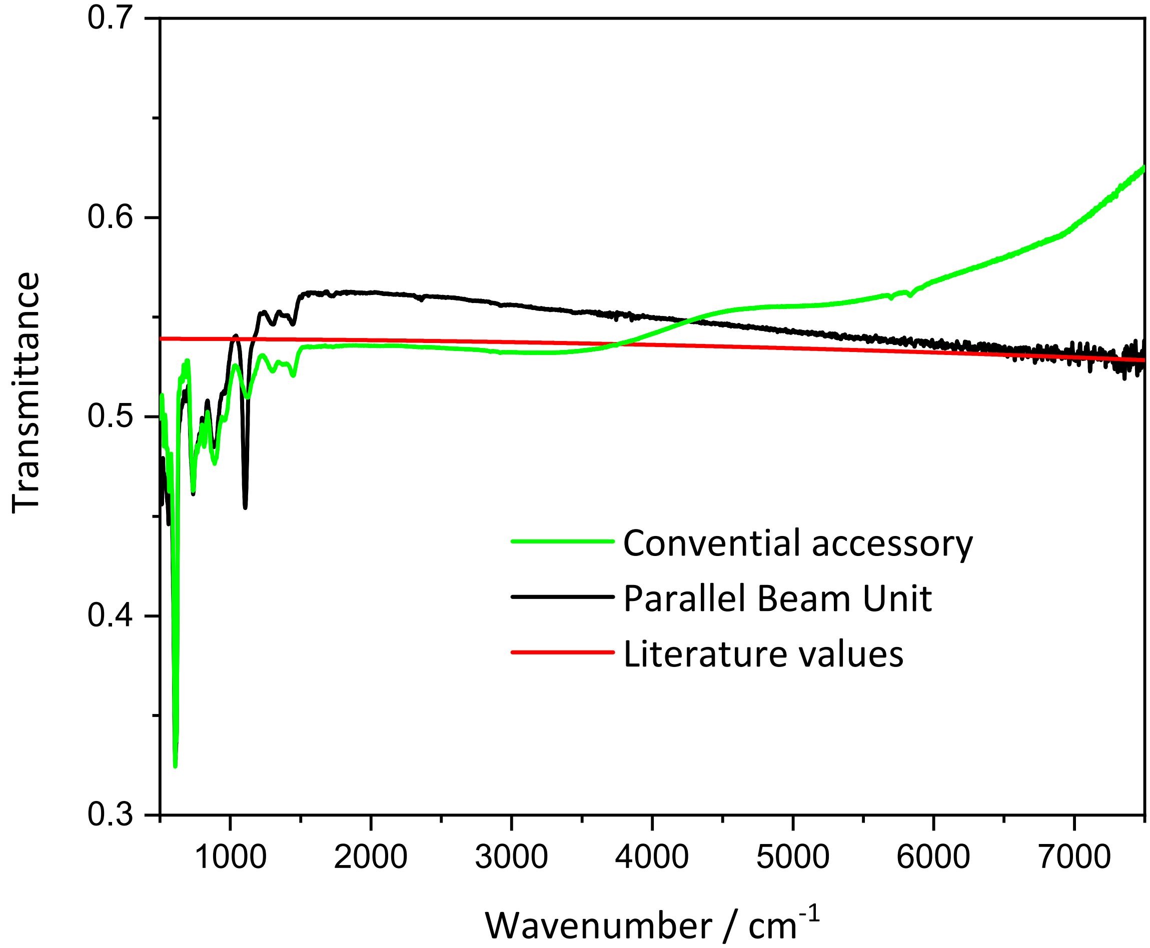


*Figure SI 2:* Comparison of the transmittance spectra of an uncoated Si substrate recorded with a conventional accessory (green curve), the parallel beam unit (black curve) and a transmittance spectrum calculated from literature values of the refractive index function (Sellmeier formula).

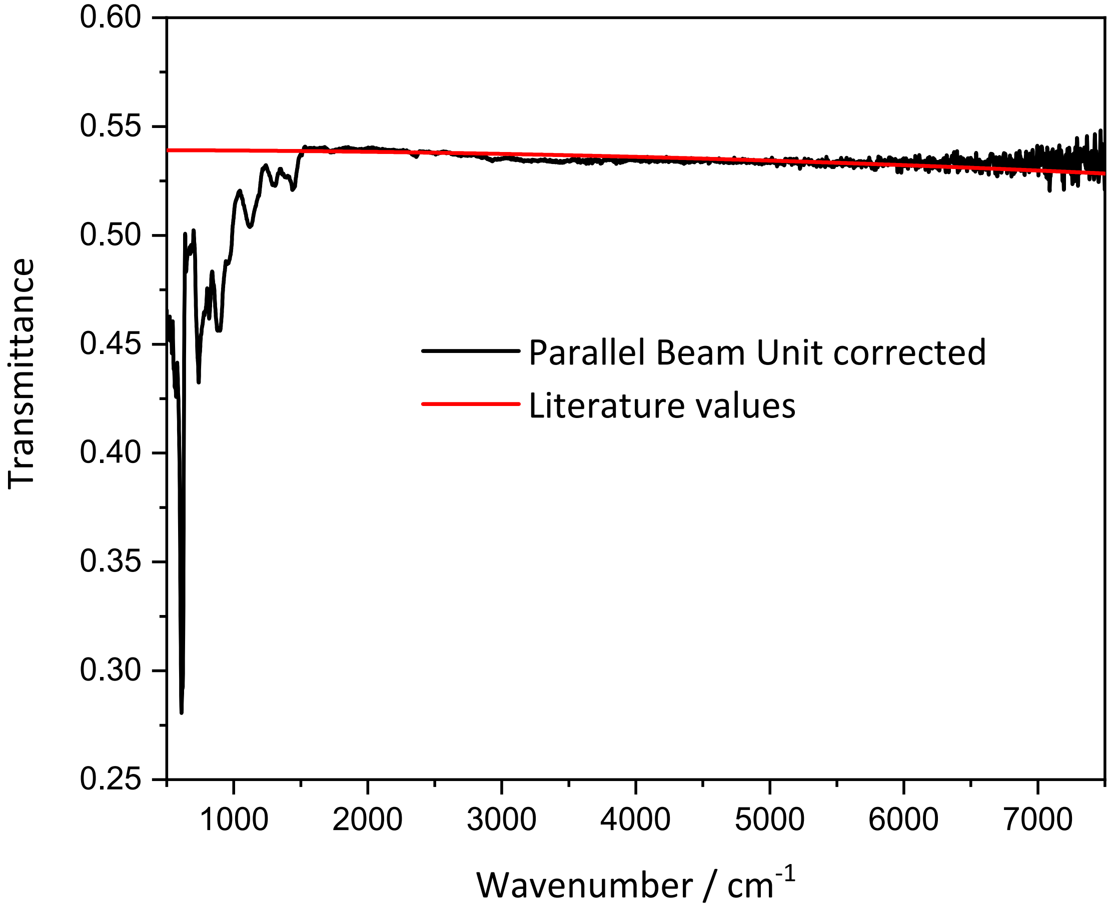


*Figure SI 3:* Comparison of the corrected transmittance spectrum of an uncoated Si substrate recorded with the parallel beam unit (black curve) and a transmittance spectrum calculated from literature values of the refractive index function (Sellmeier formula).

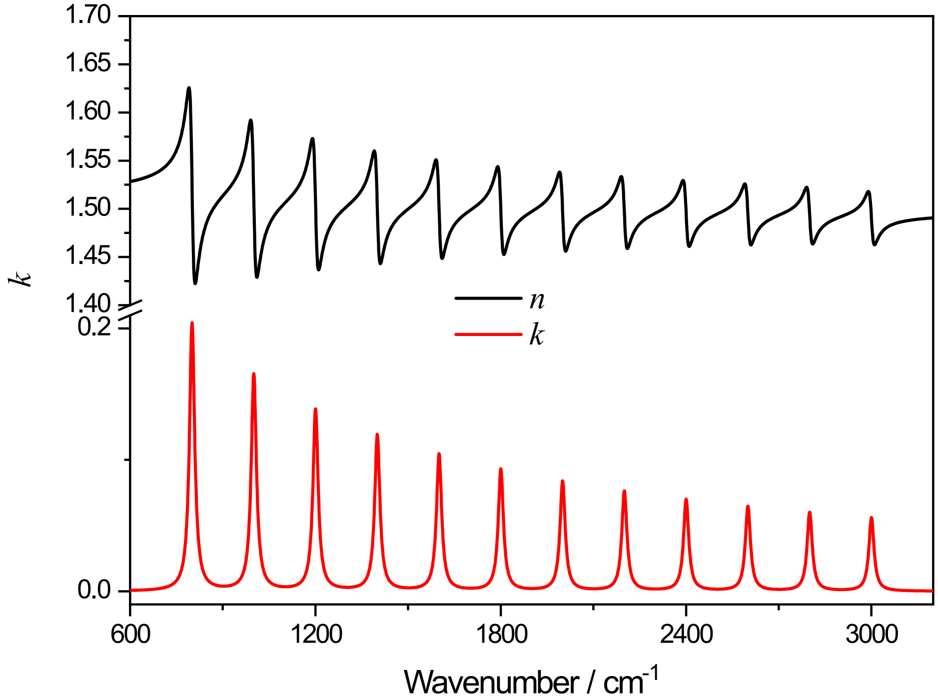


*Figure SI 4:* Optical constants of the artificial medium used for the layer in the field map of Fig. 4.

The artifical medium employed for the layer in the field map of Fig. 4 is characterized by $\sqrt{\varepsilon_\infty} = n_\infty = 1.5$ and weak absorbers every 200 $cm^{-1}$ with equal oscillator strength $S$ = 100 $cm^{-1}$ and damping $\gamma$ = 20 $cm^{-1}$ assuming the conventional damped harmonic oscillator model, $\varepsilon = \varepsilon_\infty + \sum_{j=1}^{N} \frac{S_j^2}{\tilde{\nu}_j^2 - \tilde{\nu}^2 - i\tilde{\nu}\gamma_j}$. The index of refraction and absorption function are linked to the dielectric function by: $\varepsilon = \varepsilon' + i\varepsilon'' = (n + ik)^2$.

Since the index of absorption function has to be multiplied by the wavenumber a constant decadic attenuation coefficient at the peak maximum results ($\alpha = \lg e \cdot 4\pi \tilde{\nu} k$).

*Table SI 1:* Oscillator parameters of PMMA from dispersion analysis following eqn. (2, I) of the optical constants provided in [1]. All values in $cm^{-1}$ with the exception of $\varepsilon_\infty$.

| # | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
|---|---|---|---|---|---|---|---|---|---|
| S | 46.9 | 51.3 | 34.9 | 66.7 | 53.1 | 34.8 | 198.6 | 120.4 | 92.3 |
| $\gamma$ | 18.854 | 33.89 | 32.668 | 32.369 | 17.328 | 17.315 | 37.811 | 27.006 | 23.638 |
| $\tilde{\nu}_0$ | 750 | 838.4 | 913.2 | 960.1 | 985.2 | 1063.3 | 1145.1 | 1186.1 | 1236.3 |
| # | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | |
| S | 100.5 | 57 | 106.3 | 72.8 | 201 | 34.9 | 123.6 | 74.4 | |
| $\gamma$ | 34.071 | 28.913 | 30.655 | 28.471 | 17.57 | 32.328 | 62.379 | 34.947 | |
| $\tilde{\nu}_0$ | 1263 | 1378.7 | 1441.8 | 1475.8 | 1727 | 2843 | 2946.4 | 3002.5 | |
| $\varepsilon_\infty$ | 2.1609 | | | | | | | | |

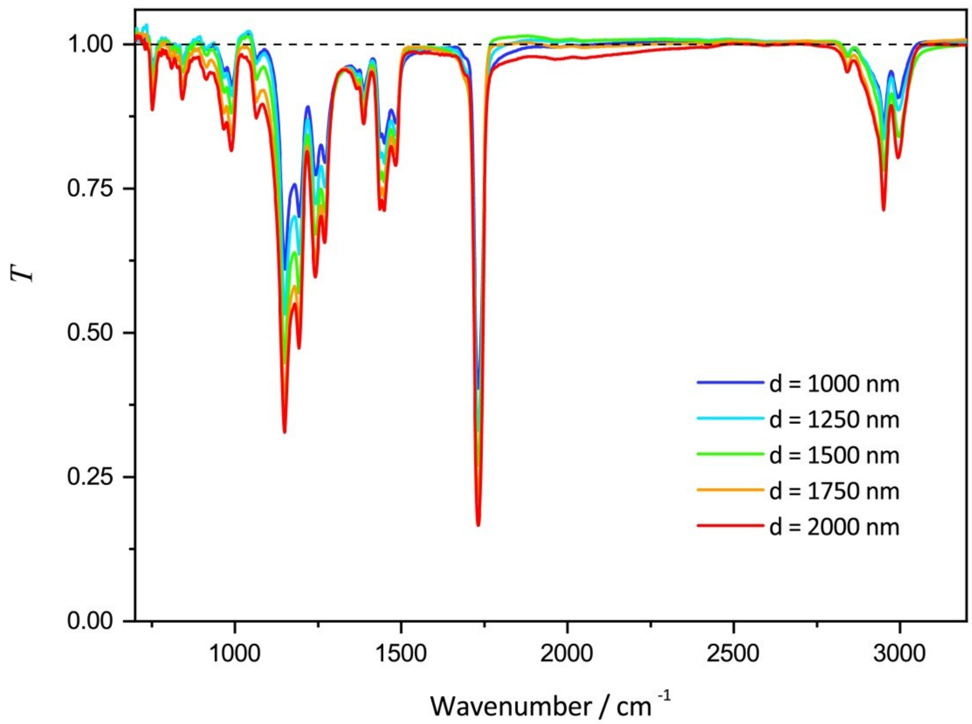


*Figure SI 5:* Baseline-corrected experimental spectra $T_{meas}(\tilde{\nu})/T_{calc}(\tilde{\nu}, d, n_{\infty})$ of PMMA on Si.

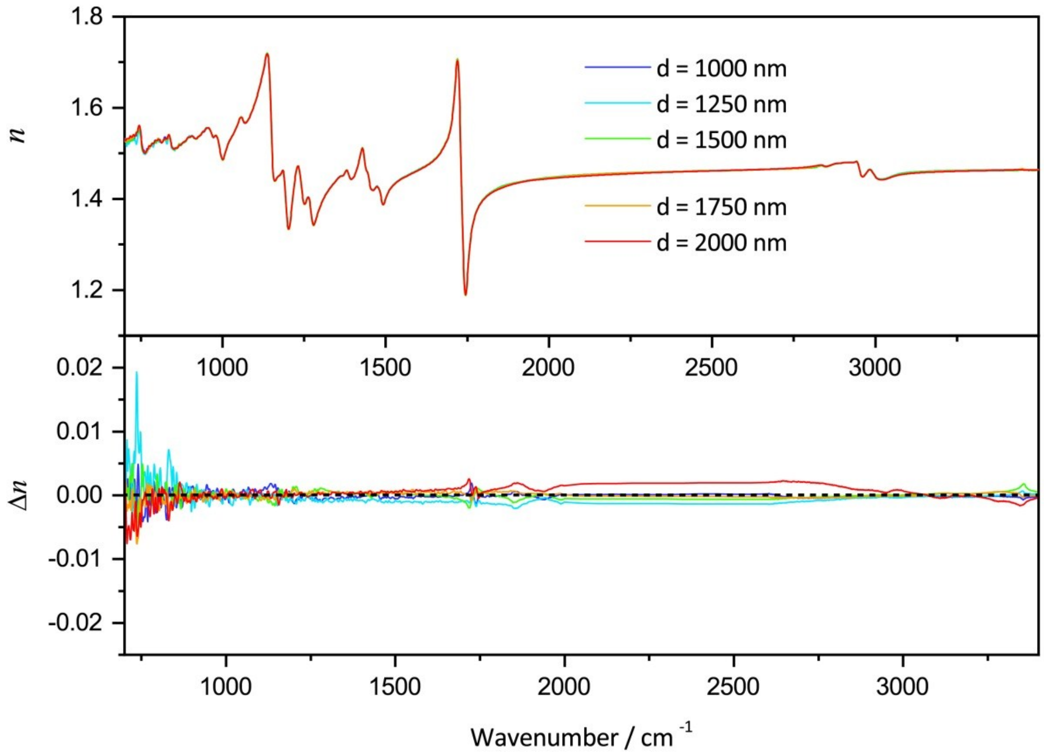


*Figure SI 6:* Comparison of the real part of the index of refraction function gained by the improved Poor Man's Kramers Kronig analysis and deviations from the mean value.

## REFERENCES

[1] R.T. Graf, J.L. Koenig, H. Ishida, Optical Constant Determination of Thin Polymer Films in the Infrared, Appl. Spectrosc., 39 (1985) 405-408.
[2] P.B. Johnson, R.W. Christy, Optical Constants of the Noble Metals, Physical Review B, 6 (1972) 4370-4379.
[3] P.G. Etchegoin, E.C. Le Ru, M. Meyer, An analytic model for the optical properties of gold, J Chem Phys, 125 (2006) 164705.
[4] P.G. Etchegoin, E.C. Le Ru, M. Meyer, Erratum: "An analytic model for the optical properties of gold" [J. Chem. Phys. 125, 164705 (2006)], The Journal of Chemical Physics, 127 (2007) 189901.