

V44

X-ray reflectrometry

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1 Objective

2 Background

[1]

2.1 Kiessig fringes

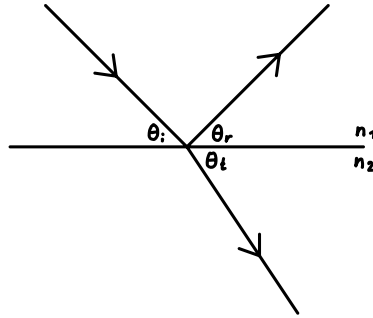


Figure 1: Depiction of reflection and refraction of light rays on a smooth surface.

Fresnel's formulae¹

[3]

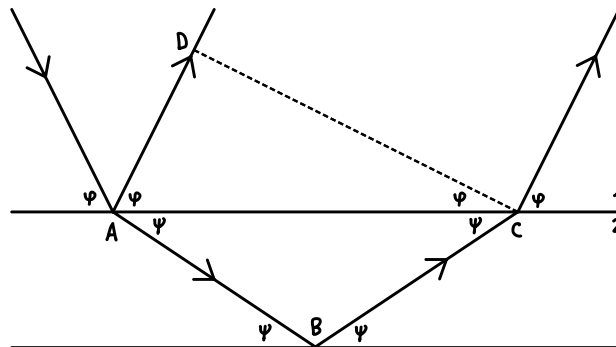


Figure 2: Schematic light paths in systems of a thin layer on a substrate responsible for Kiessig oscillations according to [3].

2.2 Stratified media

[4]

¹Following the derivation in [2] among others.

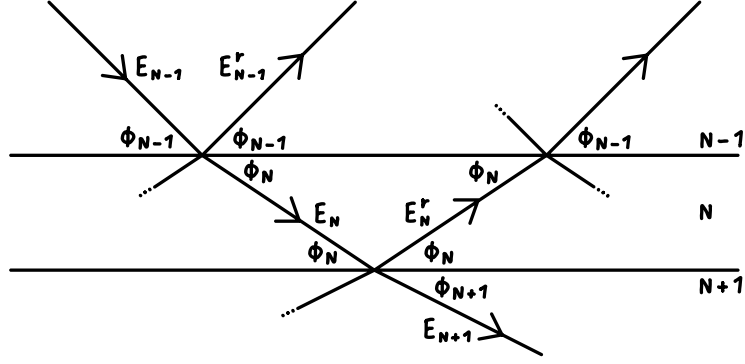


Figure 3: Conceptual visualization of the Parratt algorithm presented in [4].

3 Procedure

4 Results

5 Discussion

References

- [1] V44, *X-ray reflectrometry*. TU Dortmund, Department of Physics. 2024.
- [2] Jens Als-Nielsen and Des McMorrow. “Refraction and reflection from interfaces”. In: *Elements of Modern X-ray Physics*. John Wiley & Sons, Ltd, 2011. Chap. 3, pp. 69–112. ISBN: 9781119998365. DOI: <https://doi.org/10.1002/9781119998365.ch3>.
- [3] Heinz Kiessig. “Interferenz von Röntgenstrahlen an dünnen Schichten”. In: *Annalen der Physik* 402.7 (1931), pp. 769–788. DOI: <https://doi.org/10.1002/andp.19314020702>.
- [4] L. G. Parratt. “Surface Studies of Solids by Total Reflection of X-Rays”. In: *Phys. Rev.* 95 (2 July 1954), pp. 359–369. DOI: 10.1103/PhysRev.95.359.

Appendix