

OIC 2022 Measurement Problem

Organizer Team

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General Remarks

The OIC Measurement Problem is a unique opportunity for the optical coatings community to challenge and verify their test equipment and their test procedures for almost 20 years now. As always, a special task is given, which should be challenging but at the same time also meaningful. Moreover, the problem should be accessible to a broad range of potential participants with both, standard equipment and specialized tools. This time, the main goal of the Measurement Problem (MP) is the most precise determination of the refractive index of Ta₂O₅ at a wavelength of 532 nm. This can be done using standard techniques but also using other approaches and combinative techniques – this is completely up to the participants, their capabilities, and their creativity.

Description of the Problem

Samples

The samples will be Ta₂O₅ single layers (~5 QWOT for 532 nm) on 1" diameter fused silica substrates (thickness 2-3 mm).

Task

- Determine the index of refraction of the Ta₂O₅ film at a wavelength of 532 nm
- Optional: Determine the UV band edge of the film

Measurement Techniques: Spectrophotometry, laser reflectometry, ellipsometry, ..

Further optional tasks

Participants are encouraged to extend their measurements and activities according to their capabilities and submit additional information about the coating, such as

- spectral properties
- absorption and scatter losses

(This additional information may also be useful to solve the main task)

Note

The samples shall remain with the participants and not be sent back to the organizers.

Sample logistics

The substrates will be provided by a Swiss optics company. The coatings will be done by a research institute also located in Switzerland. The sponsors will be disclosed at the OIC meeting. The samples will be distributed by Fraunhofer IOF, Jena, upon request of the Measurement Problem participant.

Requests for samples are to be sent by e-mail to svens.schroeder@iof.fraunhofer.de
subject: "OIC 2022 Measurement Problem"

Deadline of request for samples: 15 December 2021

The samples will be delivered to the MP participants in January 2021.

Submission of Results

Participants should send their results by e-mail to marcus.trost@iof.fraunhofer.de
subject: "OIC 2022 Measurement Problem results"

Deadline for submission of results: 15 March 2022

Format of results:

E-mail containing the participant's name and affiliation as well as:

1. Attached file (MS Word) with:
Short document with brief description of measurement procedures and evaluation methods
2. Summary of results including statement regarding uncertainty of measurement (preferred data format: tabulated ASCII data or Excel sheets)
3. Supplementary results

Participants are encouraged to be generous in also delivering information on the types of equipment they have used as well as to provide any additional comments.

Evaluation Procedure of the Submitted Results

The results of the MP will be evaluated according to the regulations established in round robin experiments:

The submitted data will be evaluated according to the relative deviations of the results of the different labs from each other. The MP results will be presented at the OIC 2022 meeting in an anonymous manner. The list of participants is presented, but the sample number (laboratory number) related to the results does not uncover the respective participant. Each participant recognizes only him-/herself by the given number.