

## Design and implementation of an optical measurement system for plasma catalyst surface



### Motivation & Background

The distributed production of green ammonia through plasma catalysis is a promising pathway to achieve energy transition and decarbonization. A key factor in advancing this technology is understanding the complex gas-plasma-surface interactions, which result in synergy effects that can enhance the synthesis efficiency. Gaining insight into these interactions is essential to optimize catalyst performance and reactor conditions.

In-situ diagnostics play a crucial role in unraveling these processes by providing direct evidence of surface composition and enabling the identification of potential reaction pathways. However, the development of non-intrusive optical diagnostic techniques for plasma-catalyst surfaces remains a significant challenge. These diagnostics must be carefully designed and tested to ensure they capture real-time data without disturbing the delicate plasma-catalyst environment.

This project focuses on designing an optical test rig equipped with a user-friendly spectrometer to measure surface-enhanced Raman scattering (SERS) on plasma catalyst surfaces. Please feel free to reach out for more details!

### Assignments

- Familiarization with the surface diagnostics
- Design and implementation of the optical setup
- Testing and experiments
- Evaluation of measurement data
- Presentation of the results

### Focus Areas

Experiment



Konstruktion



Modellierung



Datenanalyse



### Datum

20.1.2025

### Start From

Now

### Kontakt

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