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## Mechanical analysis of gas diffusion layers for PEMFCs based on orthogonal design method

*Tuesday, 14 May 2024 16:05 (1h 30m)*

The Gas Diffusion Layer (GDL) is a critical component that ensures the efficient operation of proton exchange membrane fuel cells, capable of accommodating deformations and pressure differences between cell components. This study proposes a combined method of finite element and stochastically reconstruction method for GDL, calculating the stress and stress uniformity inside GDL microstructure under different compression ratios. Finally, an optimization analysis is conducted using orthogonal design method, and new stress prediction expressions are proposed. The results indicates that, fiber diameter and porosity are more sensitive. The new developed expressions are validated, which can predict and optimize the combined effects of different microstructure parameters on mechanical performance accurately. The results of this study provide predictions and guidance for designing low-stress and high-performance GDL.

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### Porous Media & Biology Focused Abstracts

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### References

### Conference Proceedings

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