HYFORCE AND LONG LIFE FUEL CELL

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(Translated)

Defective hydrogen trains in Hessen

Embarrassment for the fuel cell

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bottlenecks for spare parts - but on the other hand also with the "limited functionality of individual fuel cells". In other words, problems with the hydrogen technology itself.

Nevertheless, this threat of withdrawal alone is an embarrassment for hydrogen technology. "Obviously" the drive technology is "fundamentally unreliable", as the district administrator puts it. In fact,

SPIEGEL Mobilität

Abonnement Anmelden

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rennstoffzelle

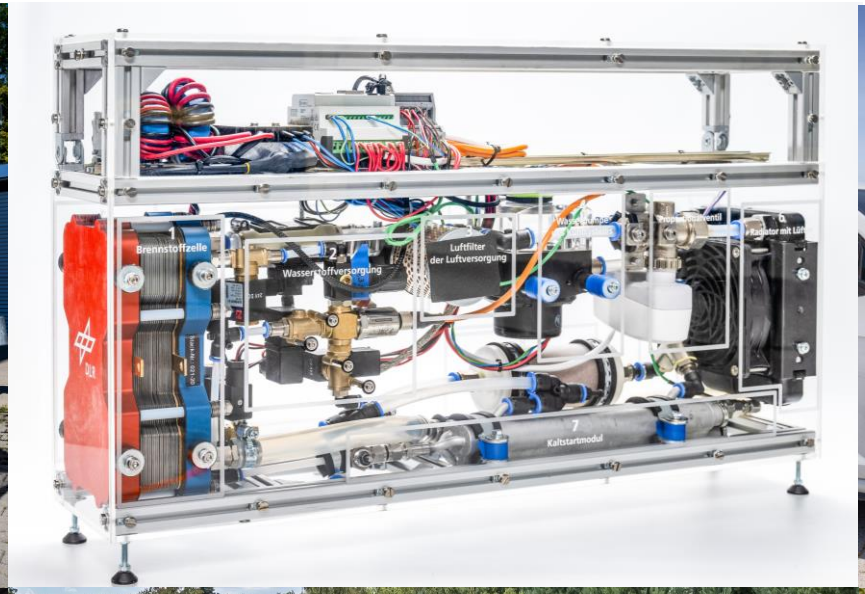
erkstatt, stattdessen fahren Busse, mal wieder: Seit fast Bahnen aus. Auch andere Regionen verzweifeln an der rnative.

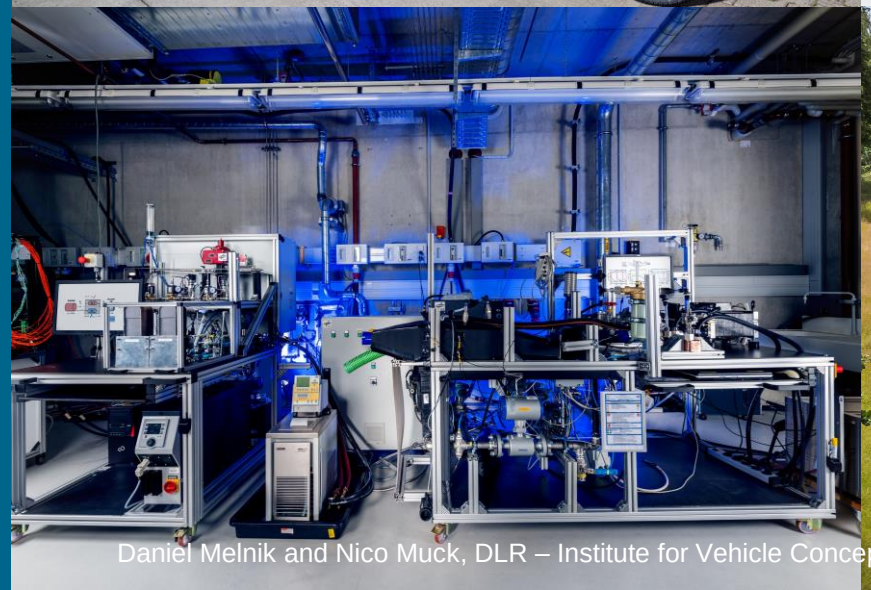
4 Min

Wasserstoffzug von Alstom im Bahnhof Bad Homburg: Seit zwei Jahren immer wieder Zugausfälle und Ersatzbusse Foto: Andreas Arnold / dpa

Die Hoffnungen waren groß, als im Dezember 2022 die ersten Wasserstoffzüge im hessischen Taunus in Betrieb gingen. Auf Strecken, die über keine Oberleitungen verfügen, soll Wasserstoff den Zugverkehr klimafreundlicher machen – gleich 27 solcher Züge sollten dort fahren und Dieselfahrzeuge ablösen.

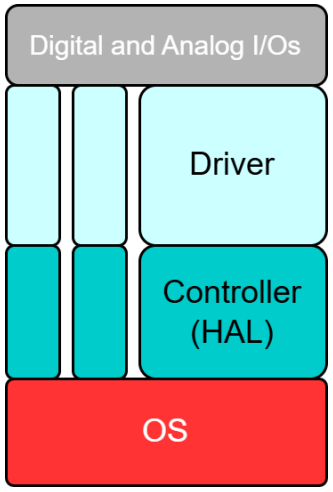
DLR – Institute of Vehicle Concepts
20+ years experience in fuel cell systems

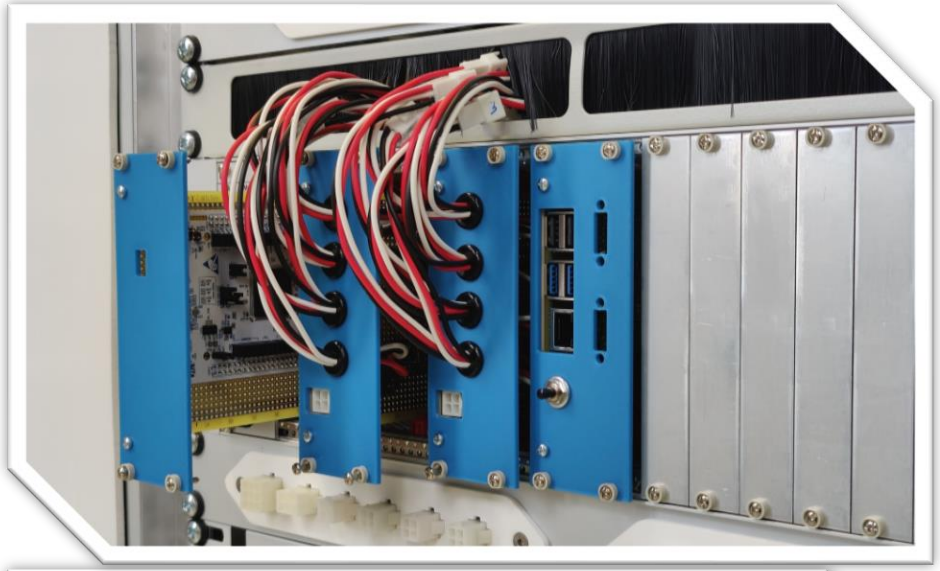


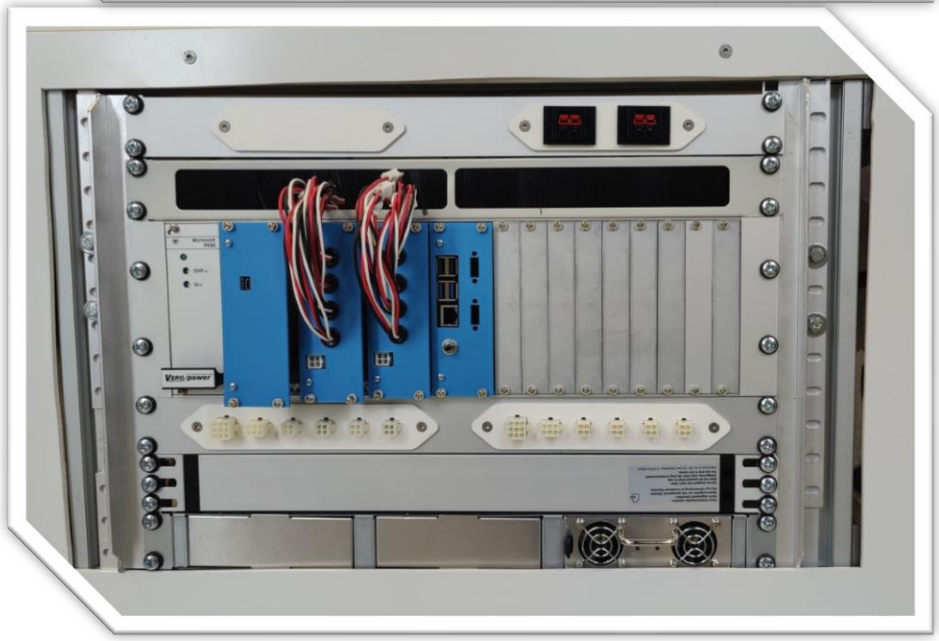


HyForce
„The Android for fuel cell systems“

- Modular system for any fuel cell system
- **HyForce Community** as the backbone:
  - Joint definiton of standards
  - Opening EOQ3 2025







Open Source Software

Open Source Hardware

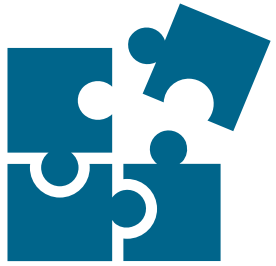
HyForce
„The Android for fuel cell systems“

Low development costs

Safe, reliable and robust systems

Short development times

Full control over system



Fully customizable and extandable

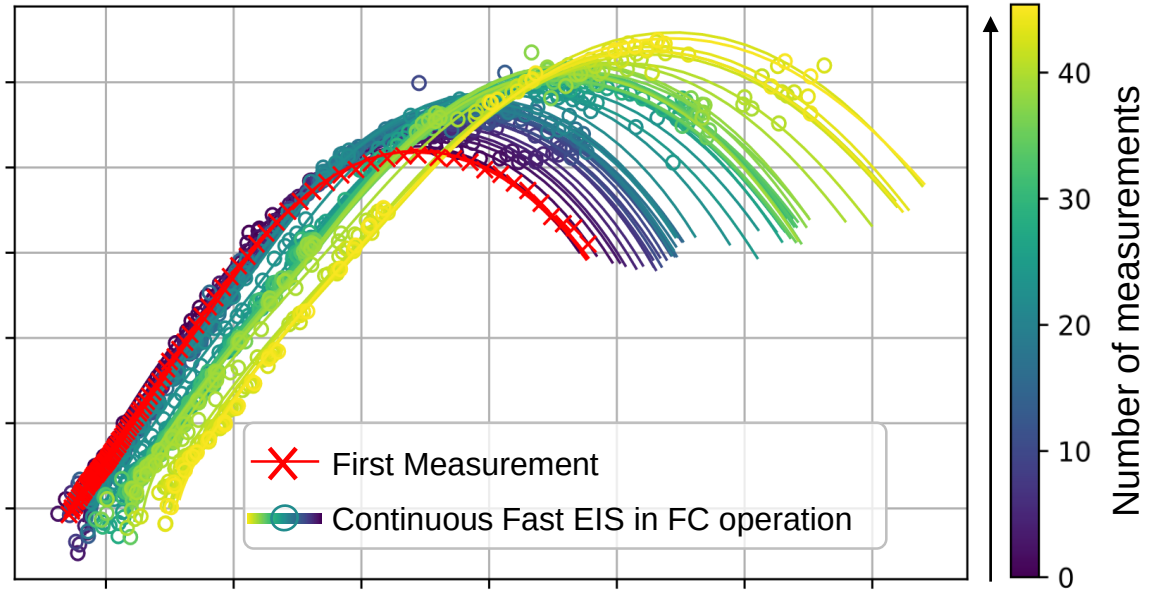
Demand

Fuel cells must prove long-term durability to be competitive

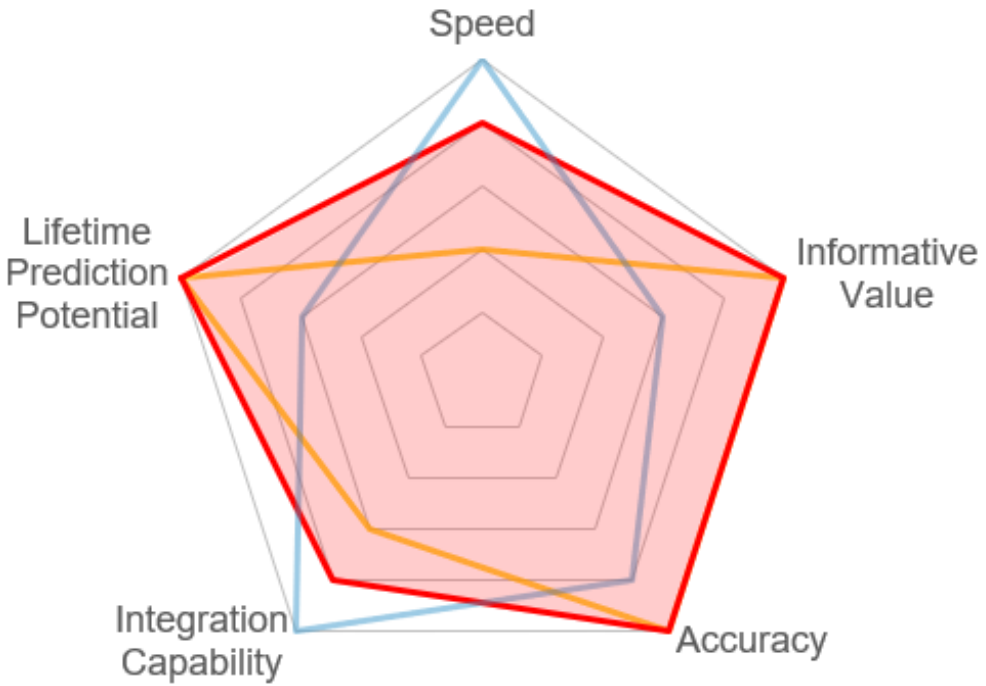
- Electrochemical Impedance spectroscopy (EIS)
  - Loss mechanisms
  - Degradation state
- The Problem: EIS requires a…
  - constantly operated fuel cell
  - long measuring time
- In real operation, this contradicts…
  - dynamic system behavior
  - continuous load changes

Solution

- Based on:
  - Optimized signals
  - Intelligent data processing
- Enables:
  - Very fast measurements
  - Accuracy ≈ conventional EIS
- Supports:
  - Development and operational diagnostics
  - Quality Assurance in production



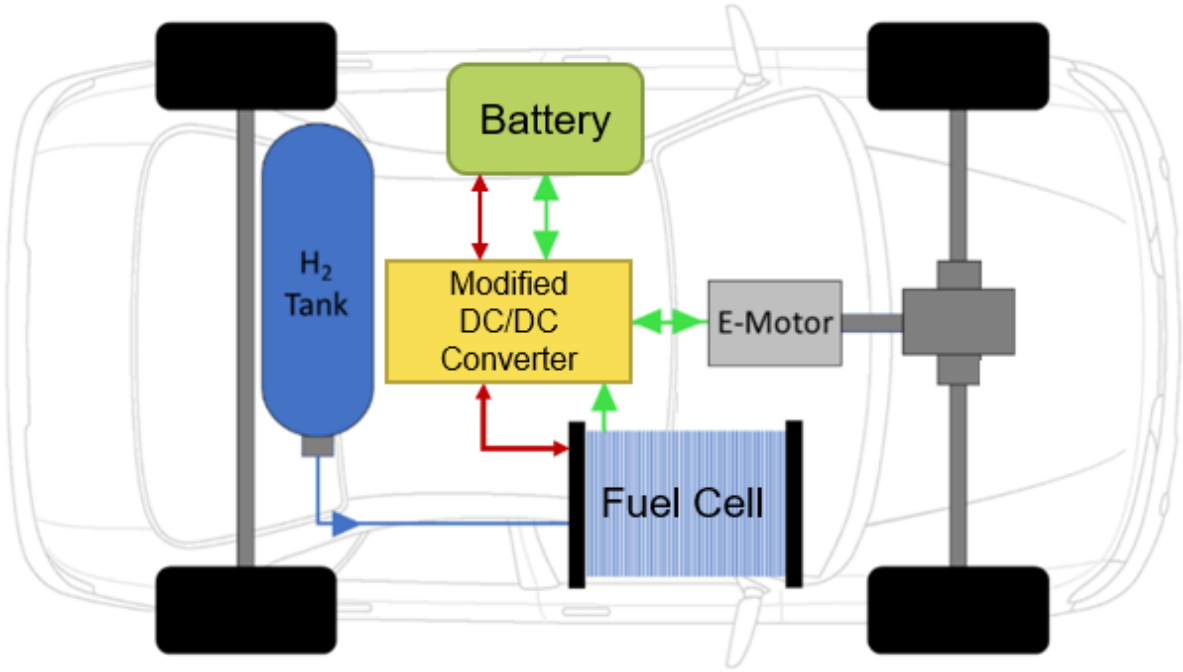
Status & USP



Conventional EIS

Fast EIS

Cell Voltage Monitoring



Interested?

- We are looking for:
  - Fuel cell OEMs and suppliers
  - Development and integration partners
  - Researchers with focus on diagnostics and control

- Application fields:
  - R&D
  - system integration
  - real-world field testing

- Contact:
  - DLR-Institute of Vehicle Concepts
    - Department of Vehicle Energy Concepts

Contact me:

Fuel Cell Operating System

Contact me:

Fuel Cell Health Monitoring