Predicting the effects of microstructure on creep strength in Ceramic Matrix Composite using Data driven Modelling

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INTRODUCTION

- Jet Aircraft Engines turbine blades, Rocket engines, Missiles, re-entry vehicles strive to improve performance.
- CMCs replace Nickel Super-alloys because of the numerous novel advantages

PROPOSED METHOD

- The traditional material science engineering takes a long time
- With the rapid development of machine learning, it is possible to predict the performance of CMC’s.
- quantify the creep strength in continuous CMC using the machine learning tools
- quantify the importance of microstructural parameters on strength.

STEPS INVOLVED IN RESEARCH

- The elastic responses are characterized using finite element analysis (FEA).
- Results from the FEA will be used as the ground truth data-driven (ML) model.
- The quantified stochastic microstructure attributes will be correlated with the statistics of the simulated response.
- The predictive capabilities of the model for a new microstructure will be demonstrated.

REFERENCES