Artificial Neural Network for Yield Strength Prediction of Irradiated RAFM Steels

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- Machine learning technique for yield strength prediction of irradiated RAFM steel (referred as YS)
- The neural network model trained on nearly 10,000 datapoints extracted from various experiments as published
- 100's of neural network model from multiple architectures are working in tandem to predict similar statistically validated YS (**fig 1**)
- Model accuracy of more than 90 % is achieved. The remaining lies within the min/max region.
- Neural network is validated against recently published results on **CLAM** steel (**fig 2**)
- The neural network can be used to predict the yield strength of RAFM steel like composition at different temperature and DPA ranages (**fig. 3**)

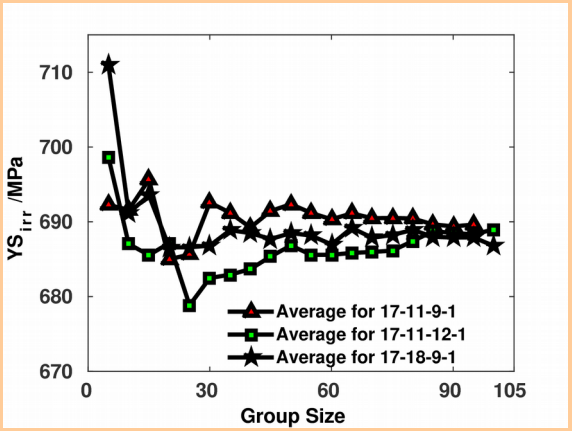

Fig. 1. Multiple architecture predicting similar YS when averaged over 100 different neural networks

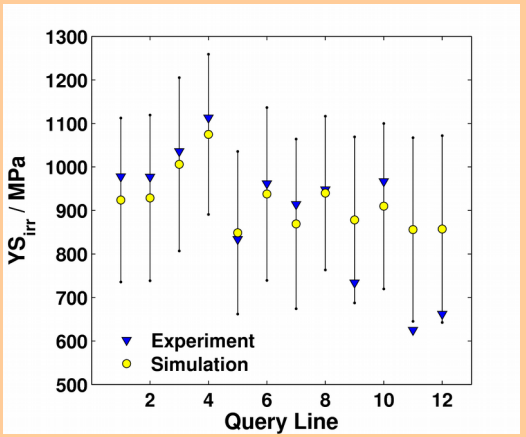

Fig. 2. Validation of neural network model using CLAM steel results. Experimental details corresponding to each query line is mentioned in preprint.

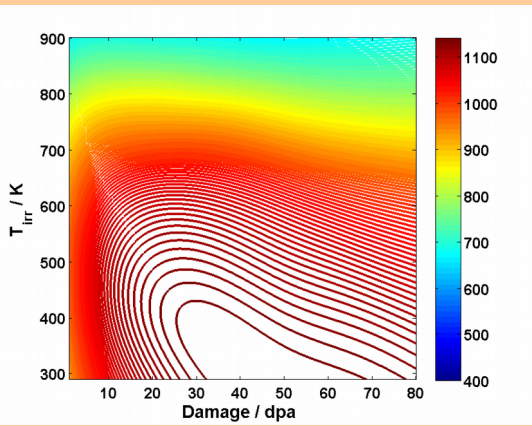

Fig. 3. Yield strength prediction for near RAFM elemental composition steel at all DPA and irradiation temperature
(Test Temperature – 298 K)