

Brief Report

Sunday, 5 October, 2025.

On Friday Raul and I tested the trained PINN model with some randomly generated new data, with some of the design parameters out of the range of training set.

Total Test Data: 14

Test set design parameters range: (Red means it's out of the training set range)

1. tCu : [5,10,15,20,25]
2. wCu: [175,200,225,250,275]
3. tLamCore: [50, 100, 150, 200, 250, 350, 400]
4. nLamCore: [6, 8, 10, 12, 16, 18]
5. tAlN: [10, 15, 20, 25]
6. tSu8: [2, 4, 6, 8]

The model predicted nicely on most of the out-of-range inputs. Although some of the percentage error are reaching 20%, most of them are <5%.

There's only One exception, the last set in the list. It's the only one input set with tCu, wCu, tLamCore and tSu all out of the training range, makes the percentage error of R up to 350%, and 50% of Q percentage error, 100% of L percentage error.

The Mean Percentage Error of other predicted output:

MPE_Q: 4.77%

MPE_R: 5.42%

MPE_L: 2.55%

The test shows that this PINN model can make nice predictions when the input parameters are not so far away from those in the training set.

To implement the applicability of the PINN model, we need a wider range of design parameters to train the model.