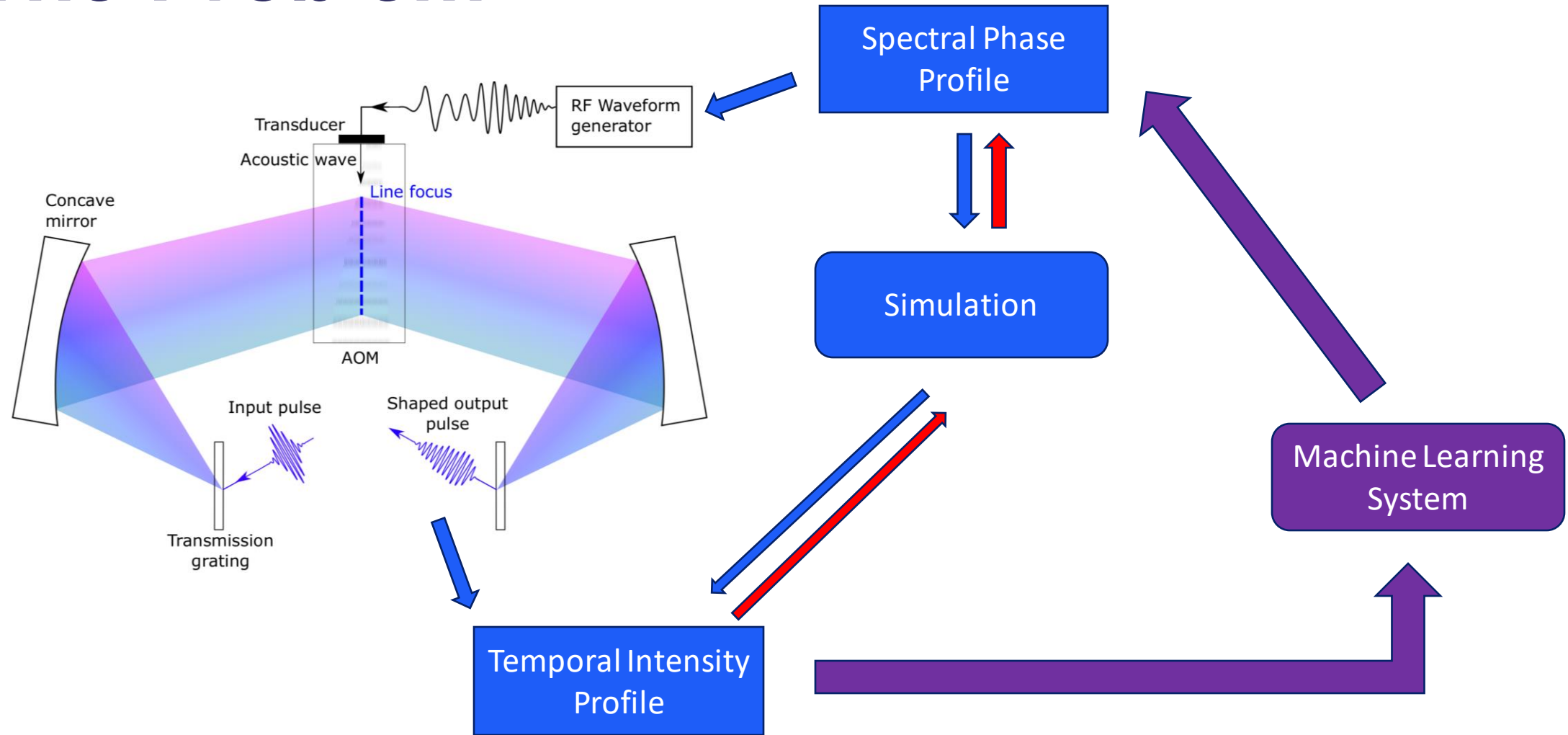
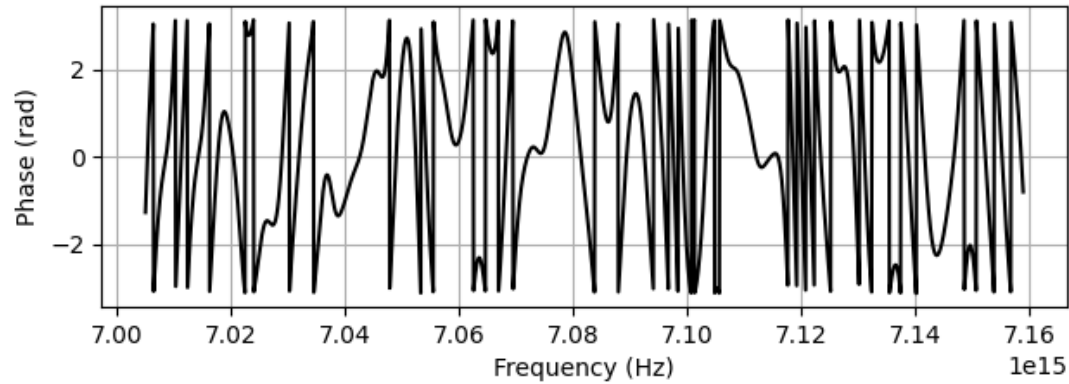


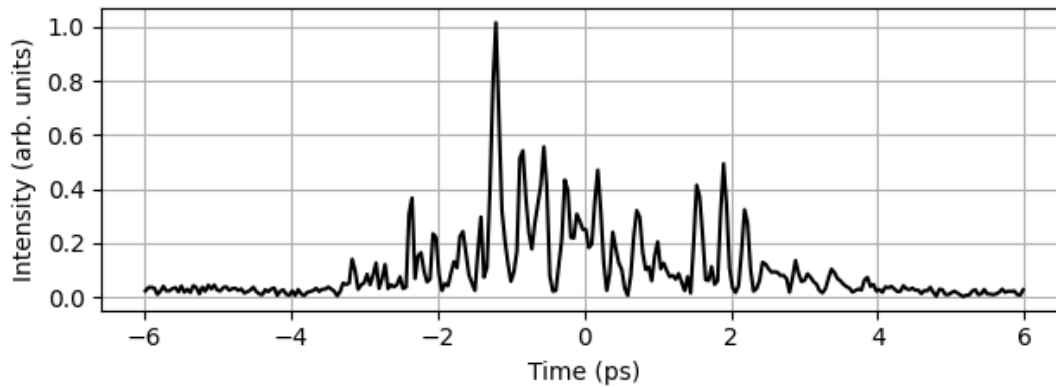
# The Problem



# The Problem



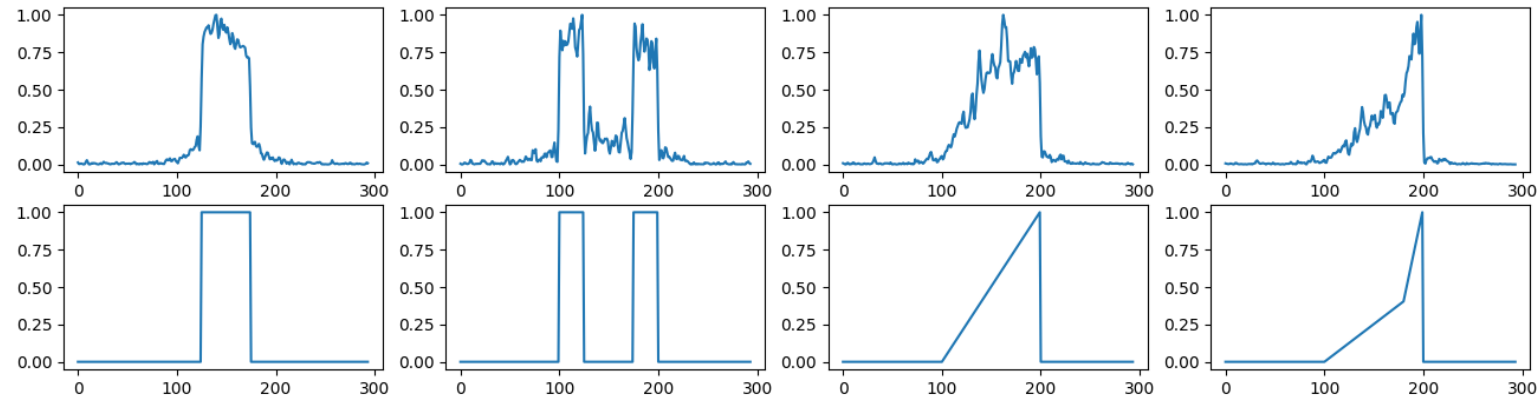
Spectral Phase Profile



Temporal Intensity Profile

# The Solution

- Unfortunately, simple solutions don't work well.
- Iterative Fourier transform is slow and limited
- Bayesian optimisation on a polynomial is slow, and limited
- Straight DNN produces unphysical results



# The Solution

We use a physically informed neural network and take advantage of the properties of the solution space.

$$\frac{1}{N} \sum |\Delta_+(e^{i\varphi(\omega)})| * \eta \sigma(|\Delta_+(e^{i\varphi(\omega)})| - \delta\varphi/\pi); \eta = 100$$

Differentiable Simulation Code

Pearson Correlation Coefficient

# Results

Using a physically informed neural network, we achieve physically realisable configurations with strong matching in milliseconds.

Deployment is underway, and nearly ready for user-facing work. We can ask for and receive arbitrary temporal intensity profiles within a 10th of a second.

