pyro-ppl/**numpyro**

Probabilistic programming with NumPy powered by JAX for autograd and JIT compilation to GPU/TPU/CPU.

Probabilistic Forecasting at Scale with Numpyro

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I. JAX AND NUMPYRO

"JAX is a Python library for accelerator-oriented array computation and program transformation, designed for high-performance numerical computing and large-scale machine learning."

"NumPyro is a lightweight probabilistic programming library that provides a NumPy backend for Pyro. We rely on JAX for automatic differentiation and JIT compilation to GPU / CPU."

II. CLASSICAL TIME SERIES MODELS

i. Exponential Smoothing

ii. ARIMAX

iii. Croston's Method

iv. TSB

III. HIERARCHICAL MODELS

i. Hierarchical Exponential Smoothing

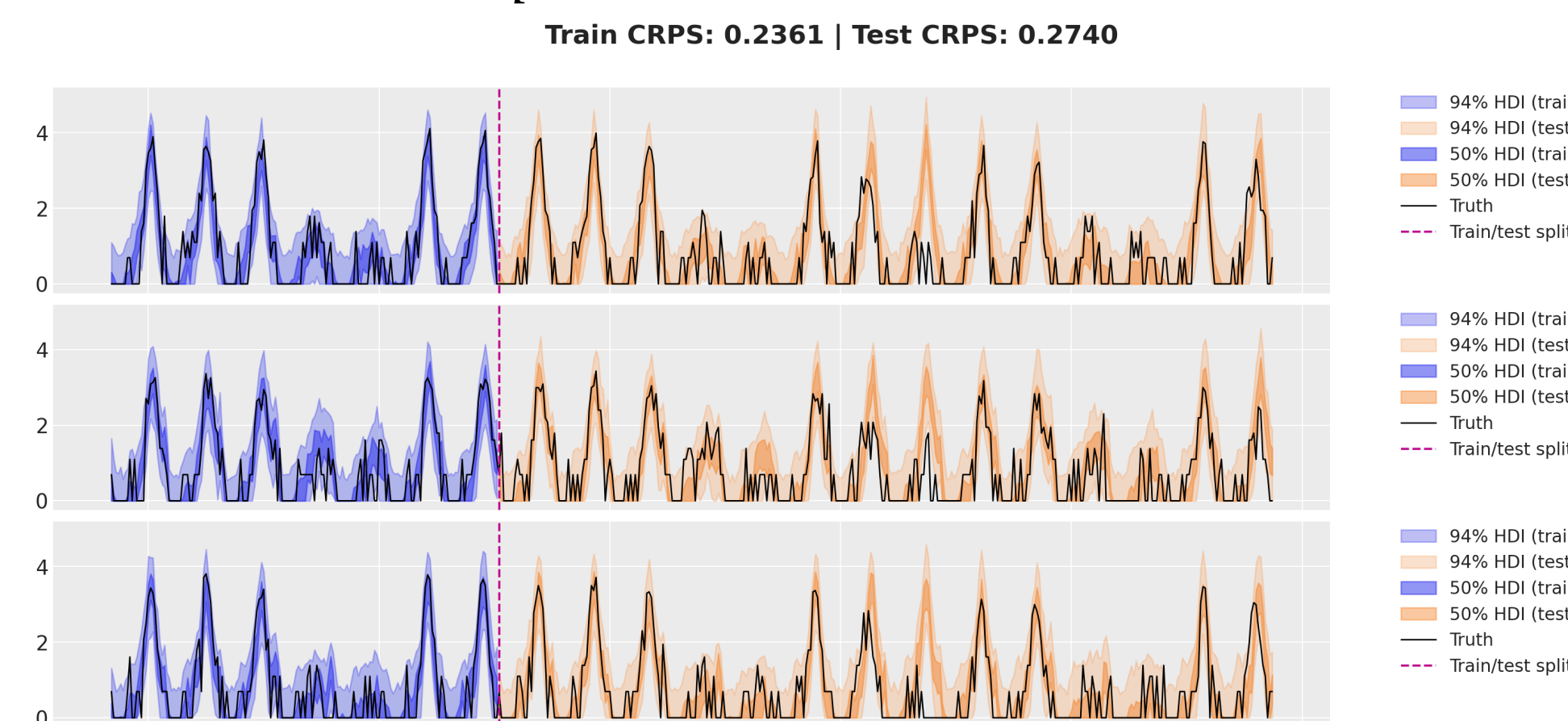*ii. Hierarchical State Space Models*

Figure 1: Hierarchical State Space Models

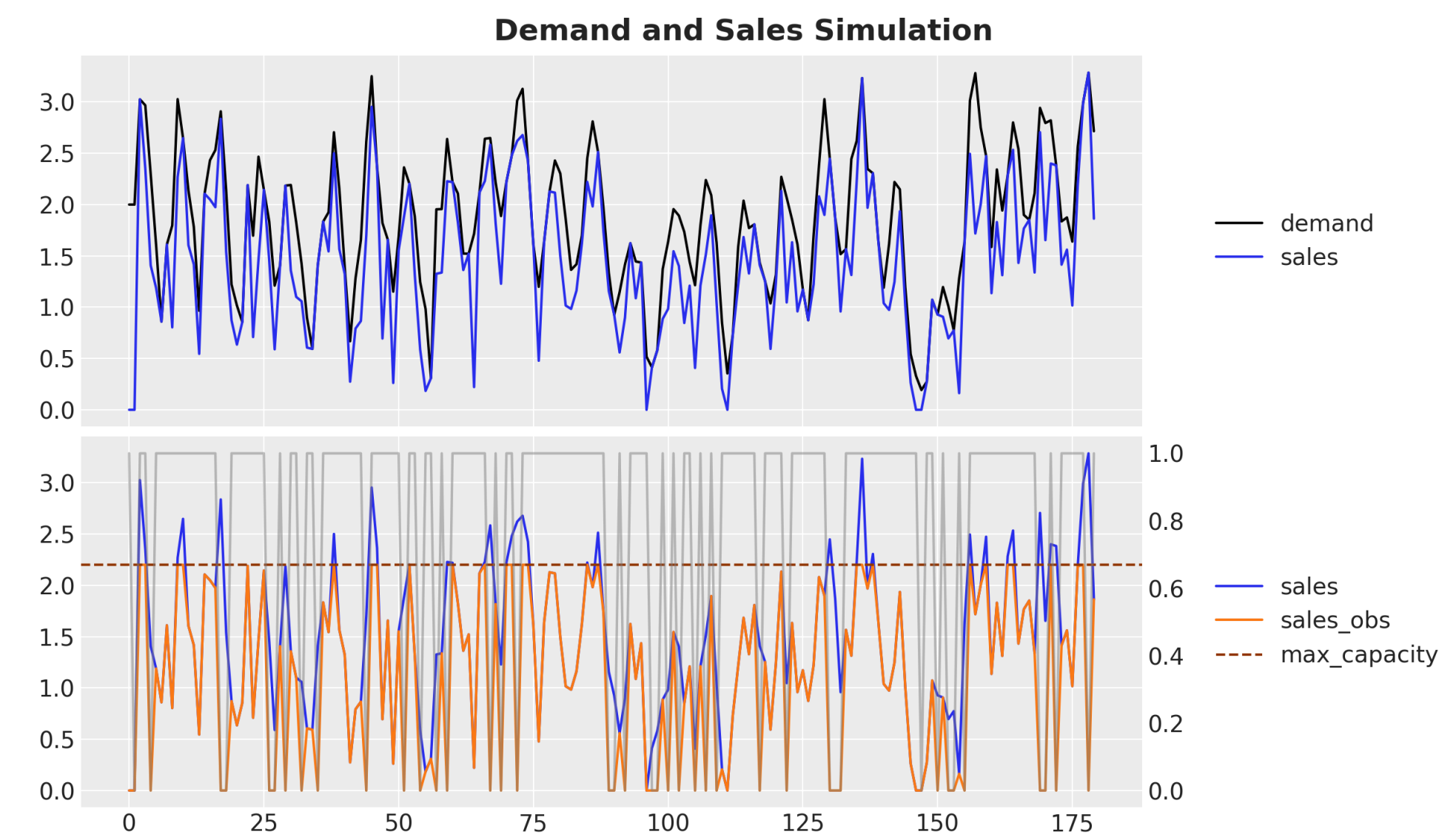## IV. CENSORING LIKELIHOODS

Figure 2: Censoring Data

Figure 3: Censored Data

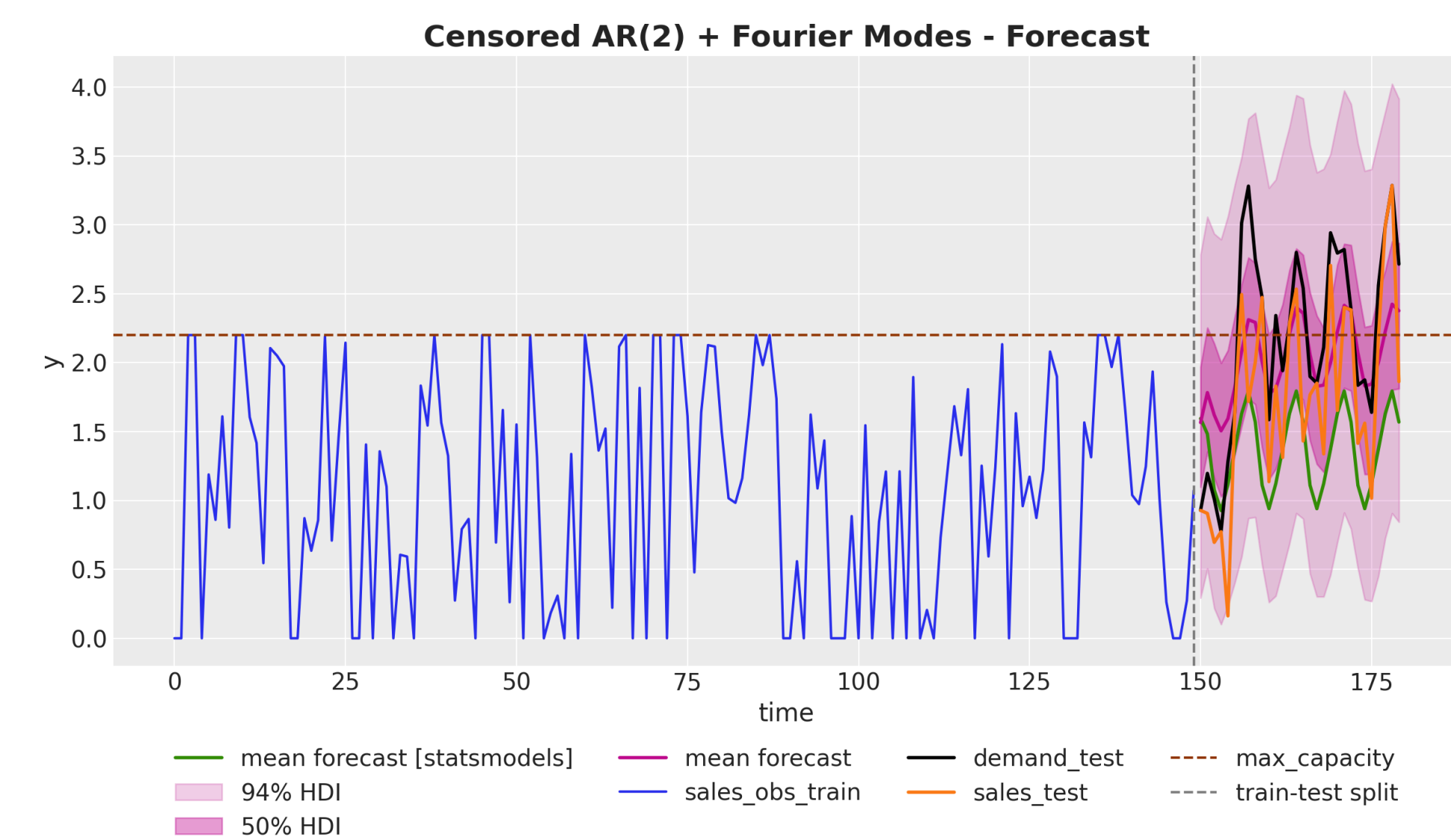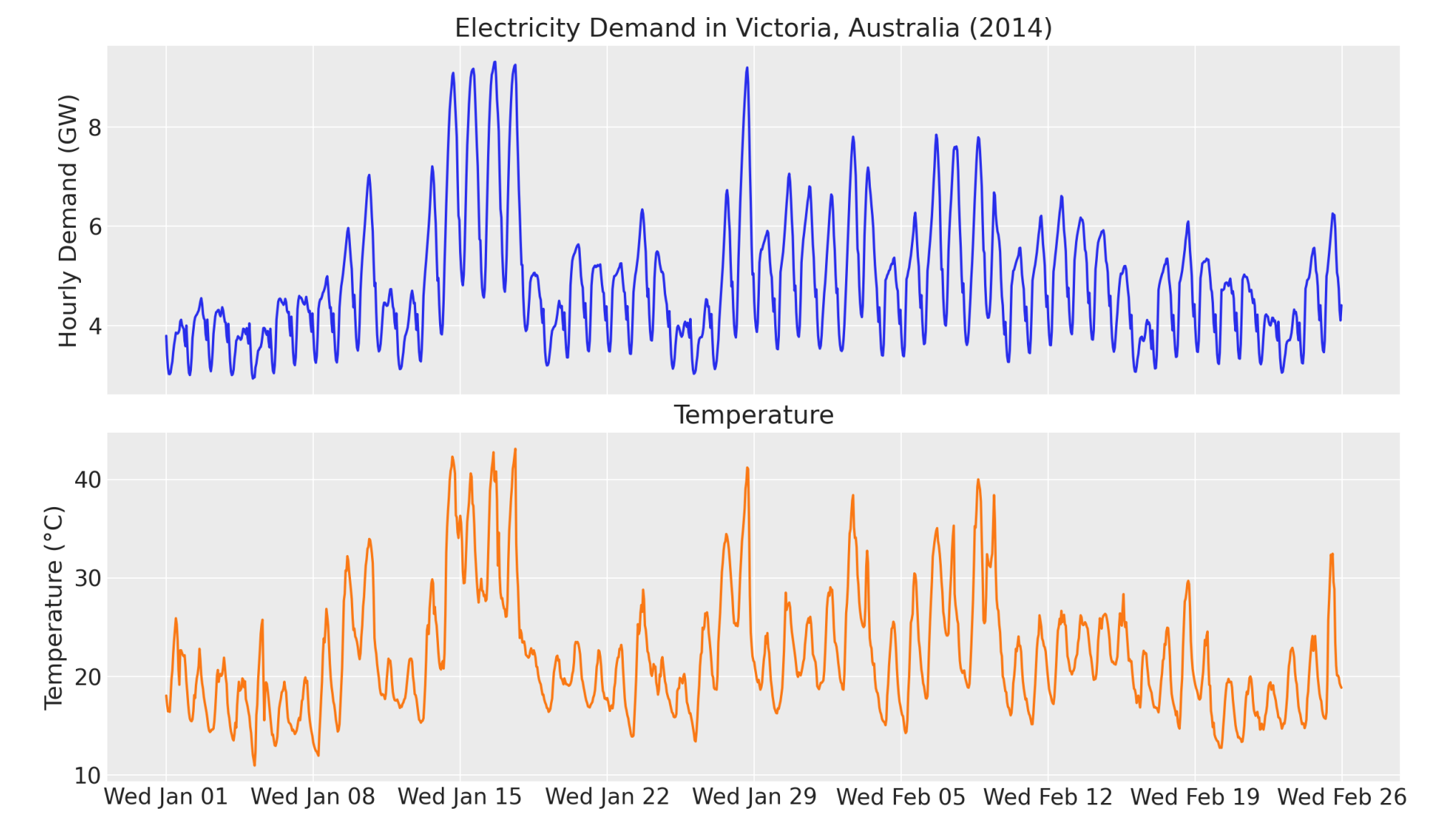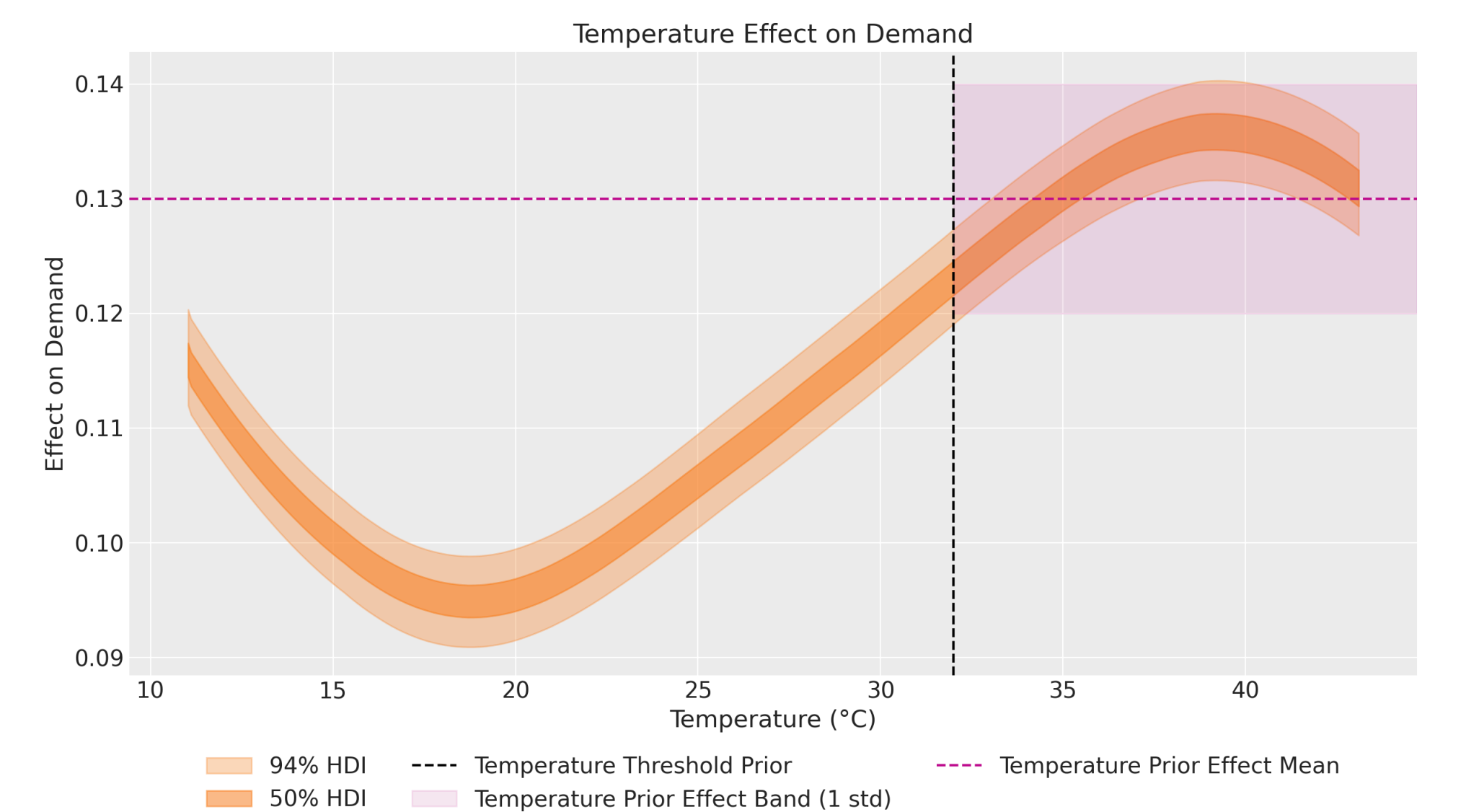## V. DYNAMIC MODELS & CALIBRATION

Figure 4: Electricity Demand

Figure 5: Calibrated Gaussian process dynamic latent variable