Update on progress

- Time interpolation model is set up
    - Cannot naively use seasonal trend decomposition due to missing data, noise and outliers
    - Identified features
    - Tried several models: tsdl , GAM (mgcv), GP (numpyro)

Next step:

- Regress on observables:
    - scattered light wave-length,
    - atmospheric pressure,
    - solar zenith angle
- Need some details:
    - How are measurements usually taken (location, timing)
    - Do we expect Ozone to change within a day (observations have minutely resolution by minute)
    - Confirm some of data fields and their dimensions

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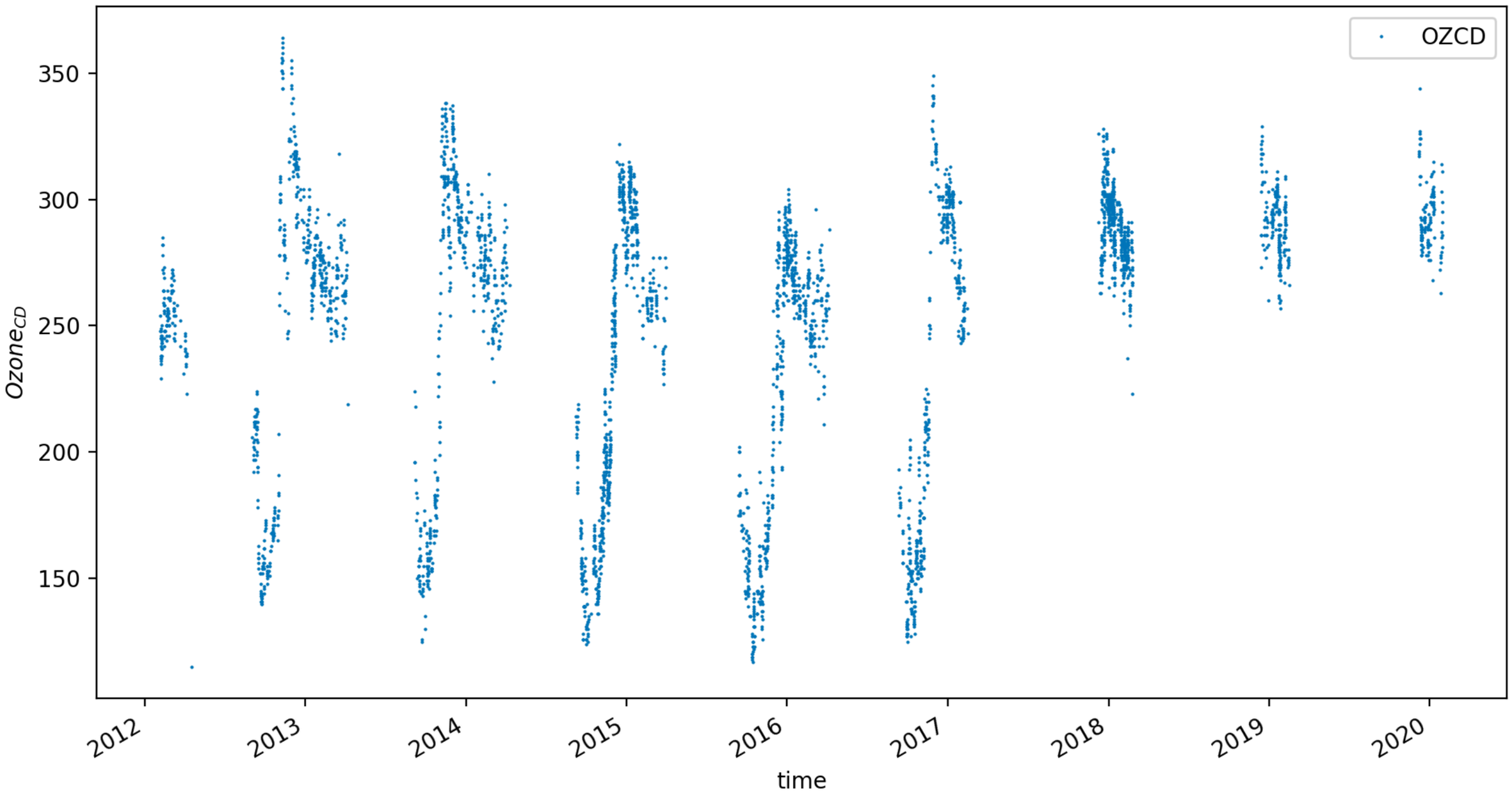

- Minute resolution
- Measured during Jan - April and Sep - Dec
- Missing data, noise, outliers

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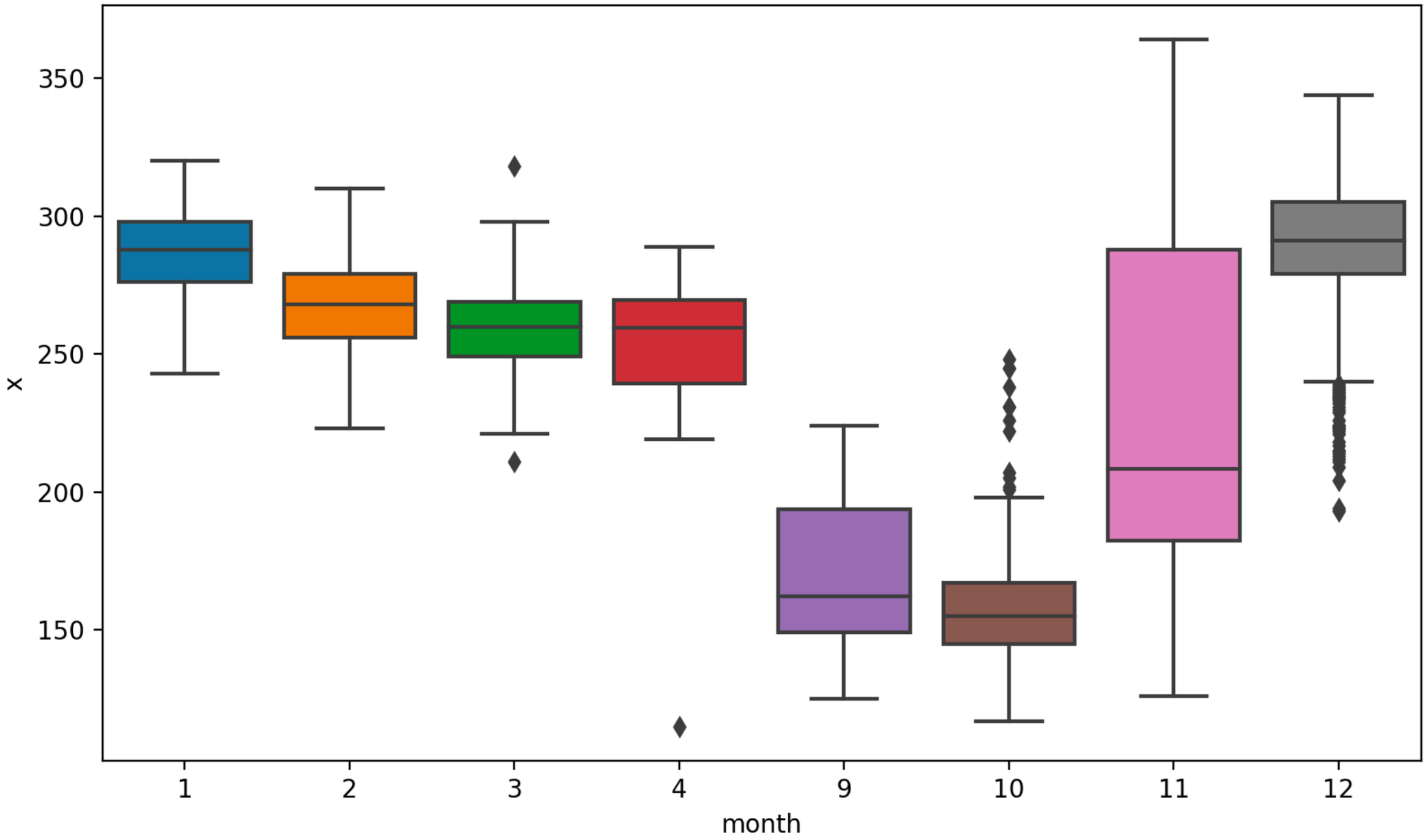
Seasonality? Yes

Let’s consider annual feature



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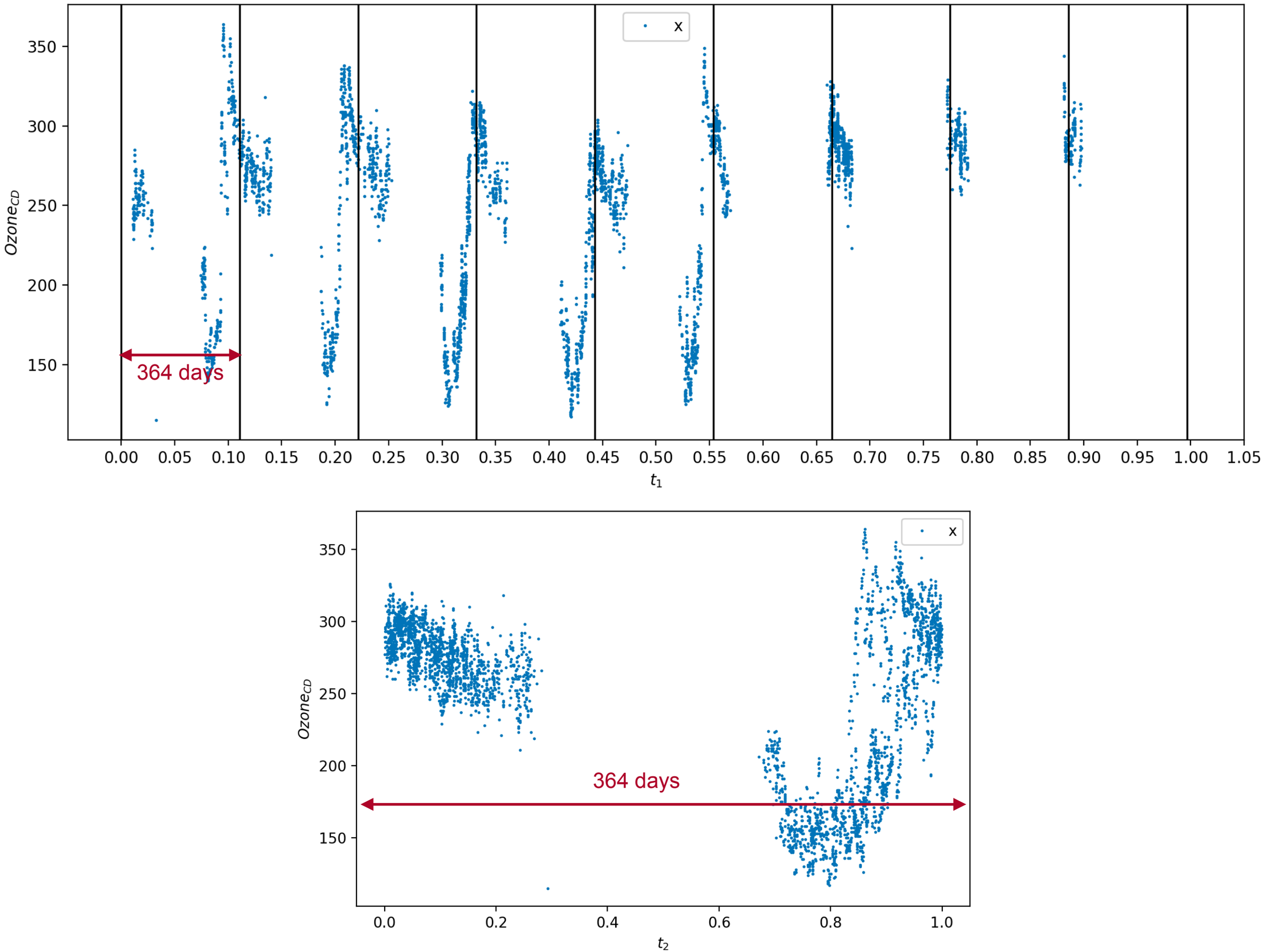
Set up features

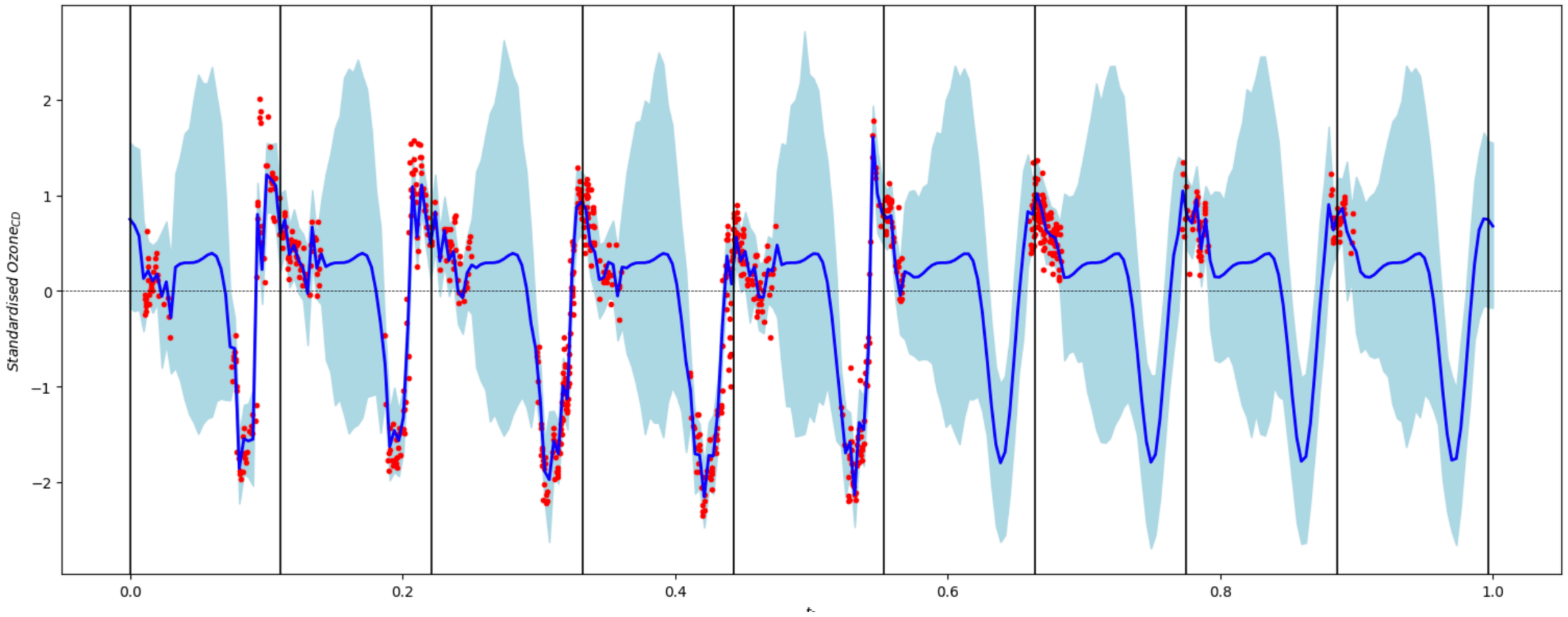


Simple model, which is easy to extend to other features

$$f = f_1(t_1) + f_2(t_2),$$
$$f_1 \sim GP(0, K1),$$
$$f_2 \sim GP(0, K2),$$

where $t_1 \in [0,1]$ and $t_2 \in [0,1]$

While t_1 corresponds to rescaled measurement time, t_2 changes within one year (52 weeks).



This model was set up in numpyro. See our GitHub repo.

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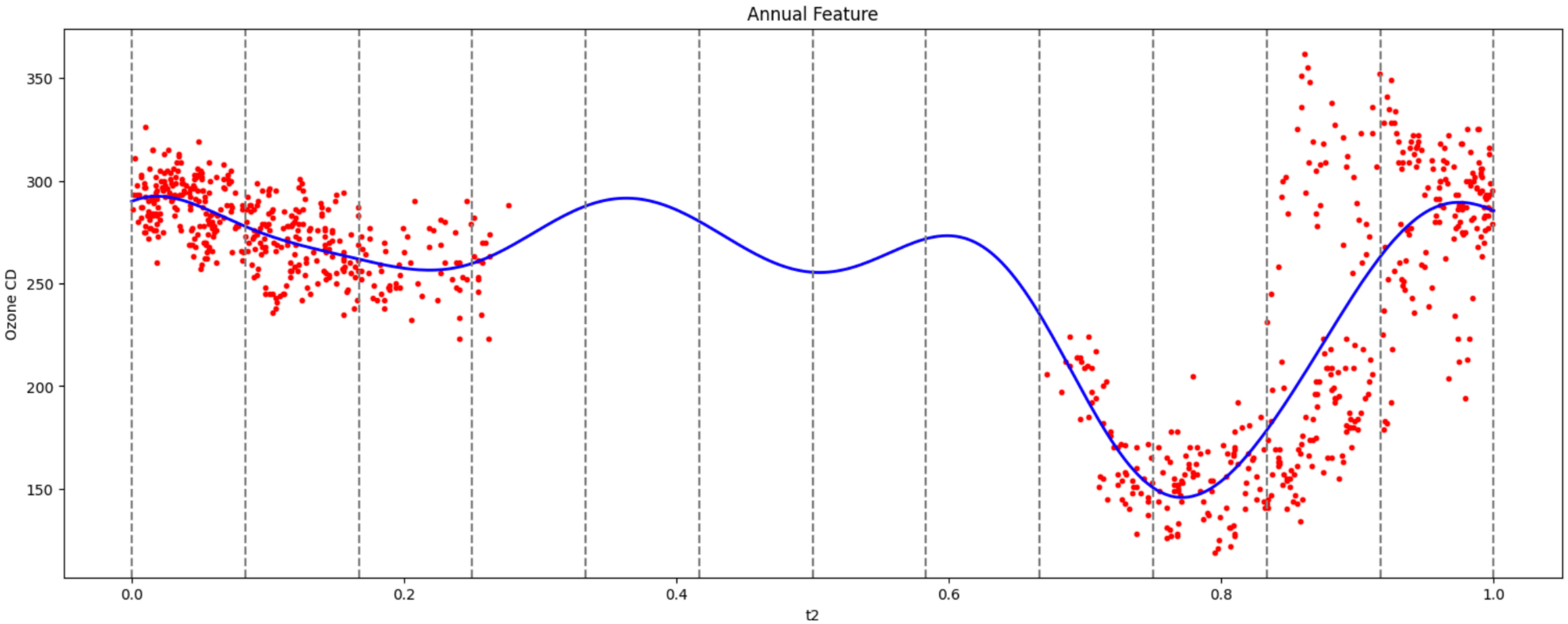
Fit on the annual feature space



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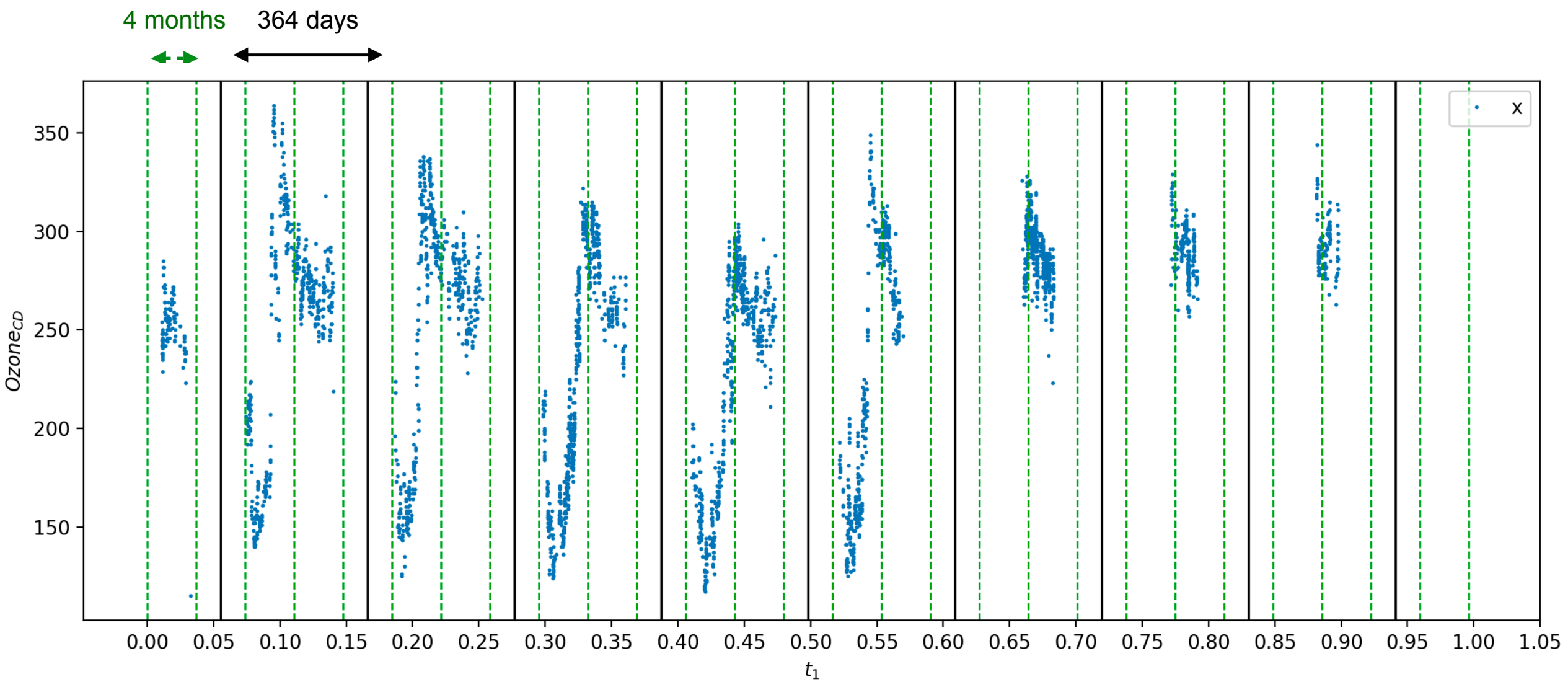
Some refinement is in order



- Better to start the year on May 1
- Tighten priors
- Maybe, bin to daily
- Transform
  - log
  - diff
  - diff(log)

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