UQ Progress Update

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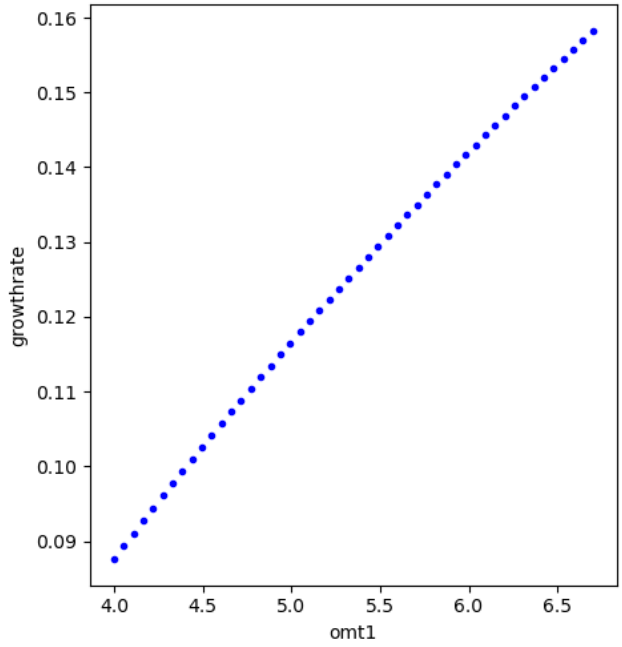
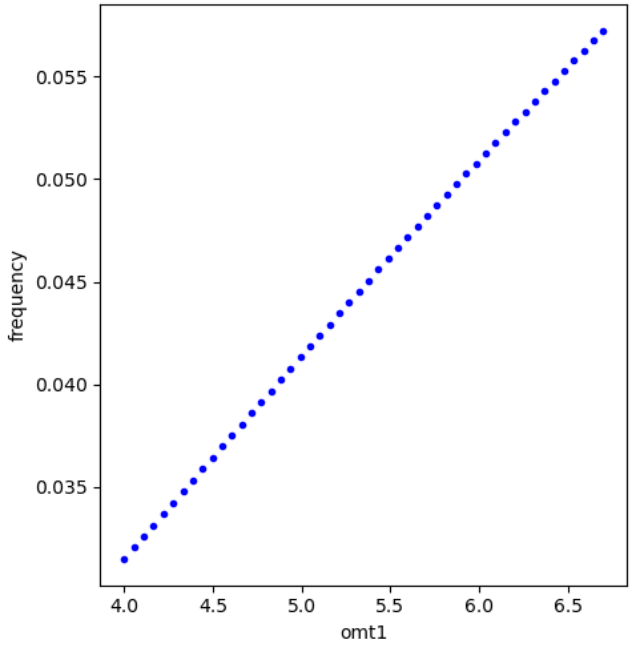
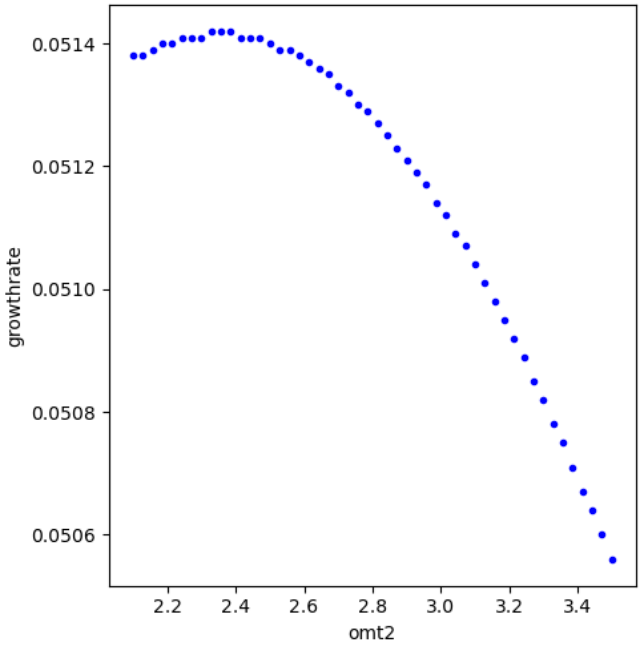
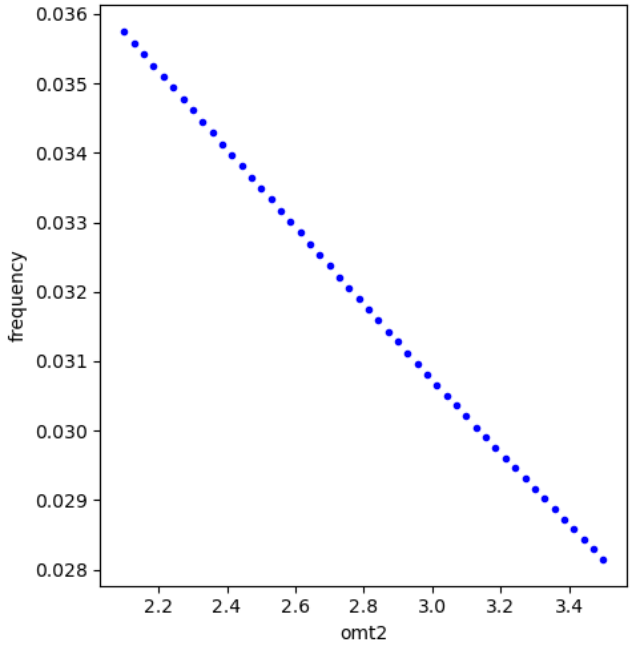
Hello, we have a scheduled meeting tomorrow. Here is an update and some things we might want to quickly discuss tomorrow.

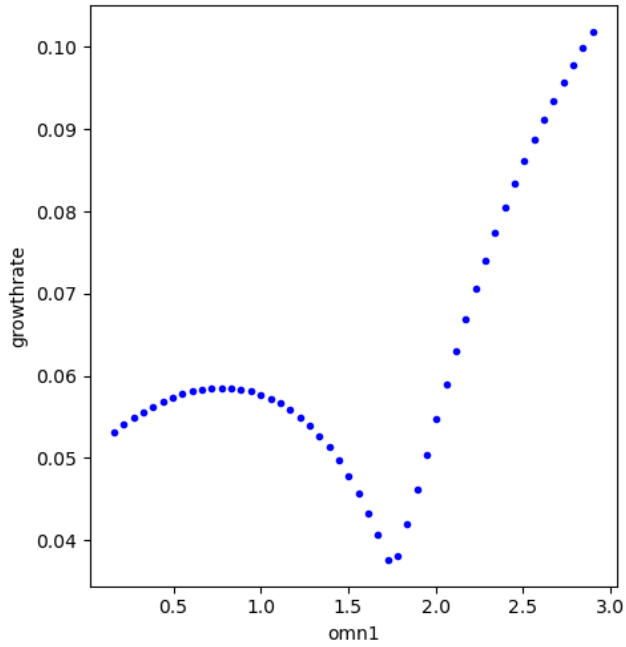
The last thing we discussed was a problem with limited resolution causing large discontinuities that made the forward model unreliable. I increased the growth rate resolution (omega_prec) from 1e-3 to 5e-3, this solved the problem. I still need to implement the higher resolution adaptively to avoid unnecessary compute.

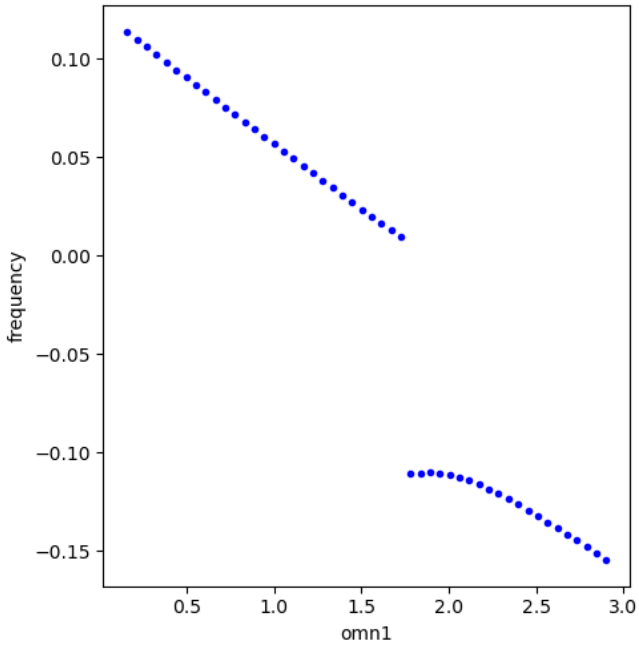






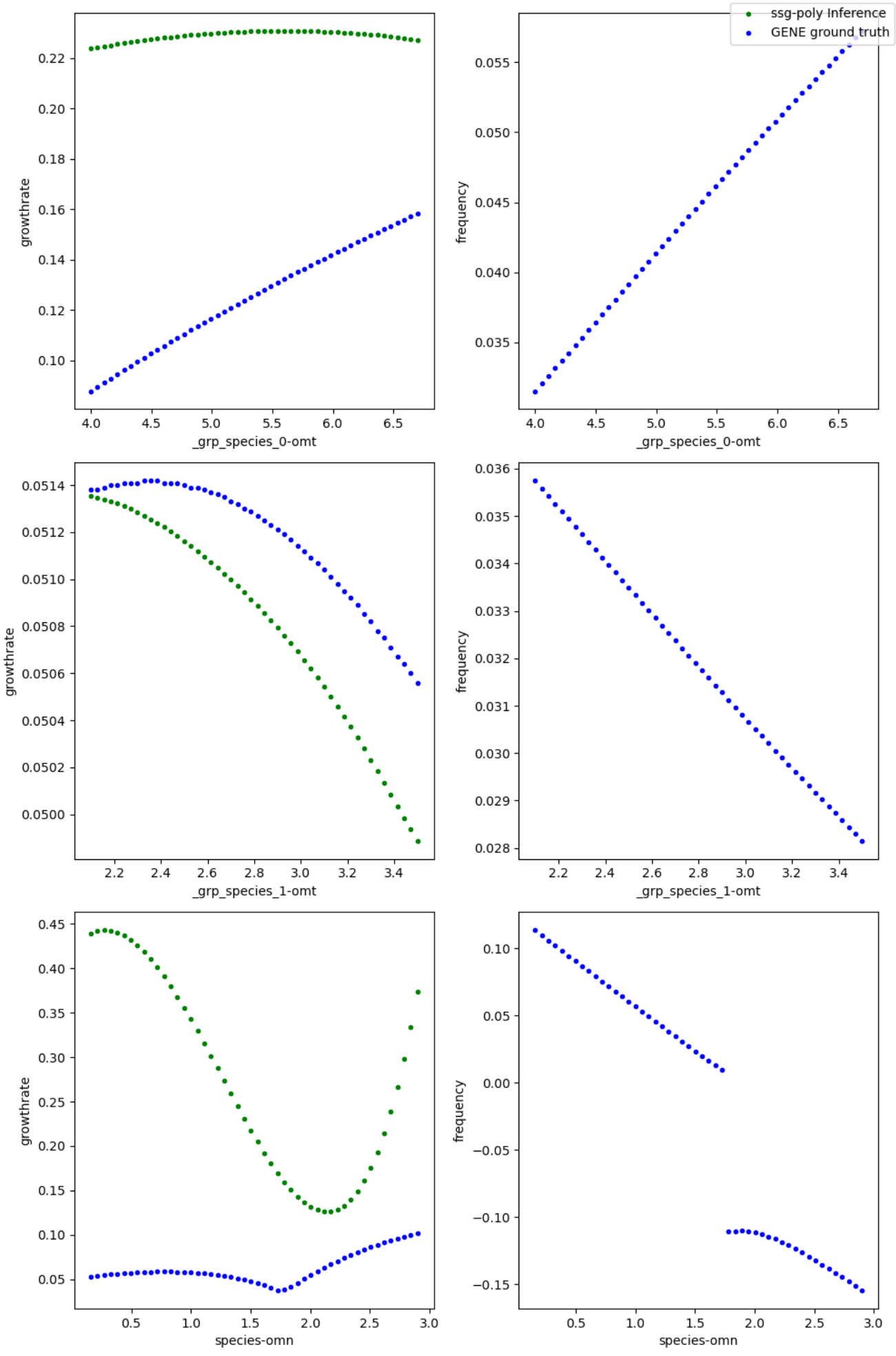




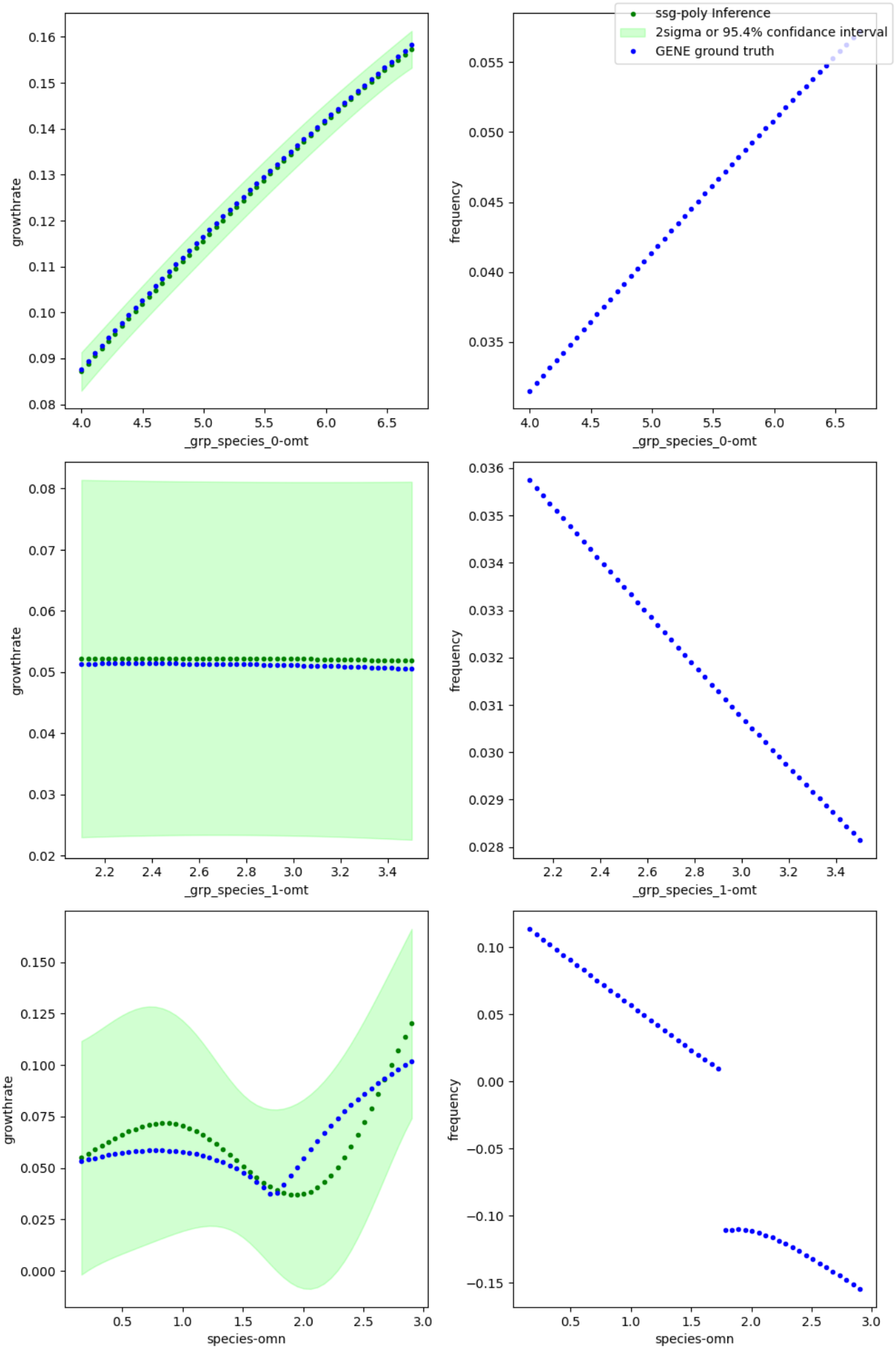


After this fix there has been some interesting results to note. The SSG-polynomial model at level 7 or

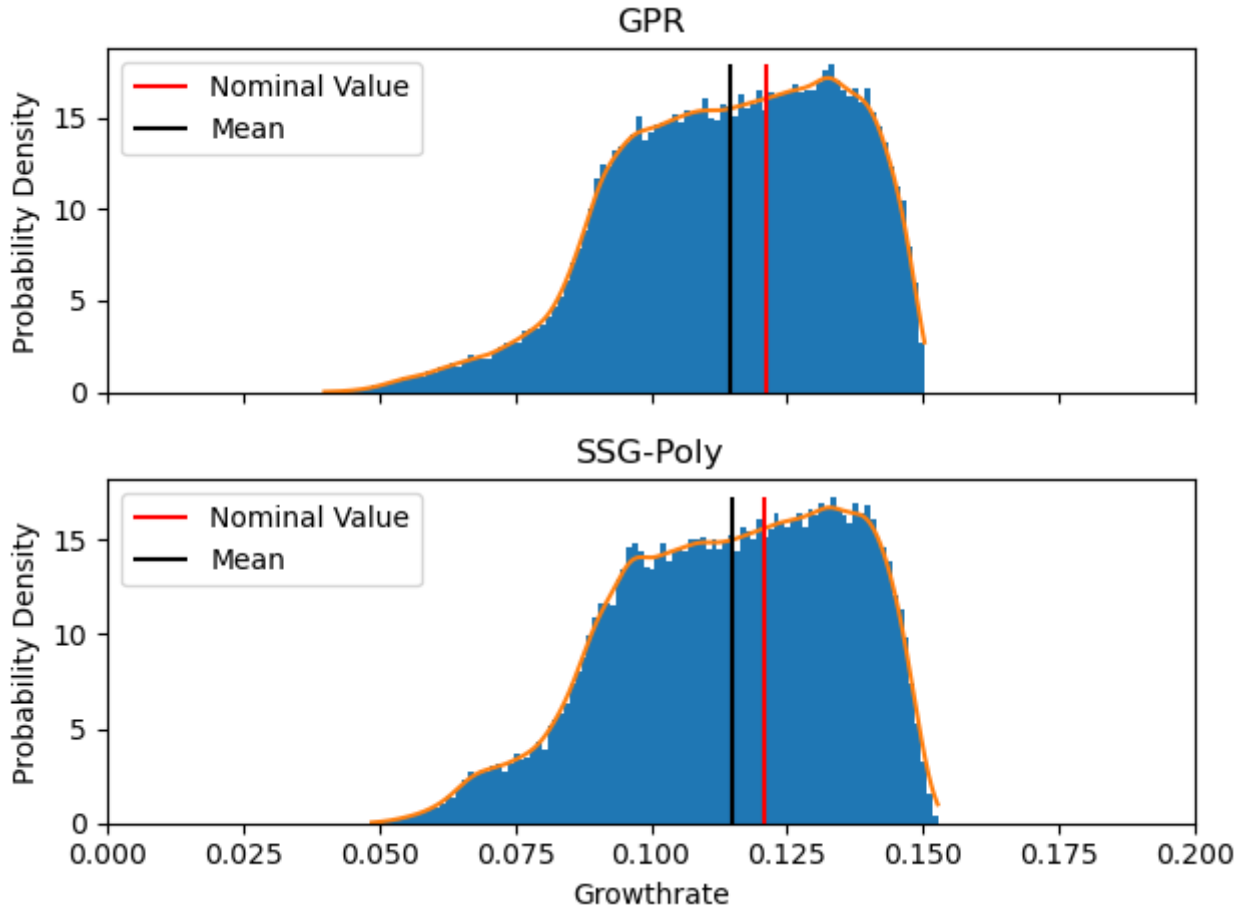
84 points is used to infer the growth-rate of a linear scan of each parameter (keeping the others at nominal value).


ssg-poly Inference
GENE ground truth
growthrate
frequency
_grp_species_0-omt
_grp_species_1-omt
species-omn

Here is the same plot for GPR, fitted using 100 uniformly sampled training points.



When using these models to find the UQ assuming uniform error they both get very similar results.



GPR MEAN AND VAR	[0.11464856, 0.00042165]
POLY MEAN AND VAR	[0.11477173, 0.00043093]
DIFFERENCE	[1.23173582e-04, 9.27607355e-06]

The mean and variance of my SSG-Poly distribution are similar to the mean and var of Ionut's method:

SSG DISTRIBUTION MEAN AND VAR	[0.11477173, 0.00043093]
IONUT's MEAN AND VAR	[0.1147025, 0.00043068]
DIFFERENCE	[6.92310265e-05, 2.45936869e-07]

Points for tomorrows meeting:

- comments on the most recent results in this email
- LUMI is down for a month. I propose I construct a toy problem for SG++ practice
    - this could be making a function that resembles the omt1-grothrate plot and try to fit it with SG++ both statically and actively.
- Tobias is there any way to get GENE to return a negative growthrate for stable modes. Perhaps with the eigan value solver?? This could solve the fact that Ionut's SSG needs a value for every input and I get NaN when it is stable and runs for long. Would the eigan value solver then be faster than the IV for determining if the run is stable?

I think this should be enough food for dicussion in tomorrows meeting.

All the best,
Daniel