Troubleshooting

Jūlija Pečerska
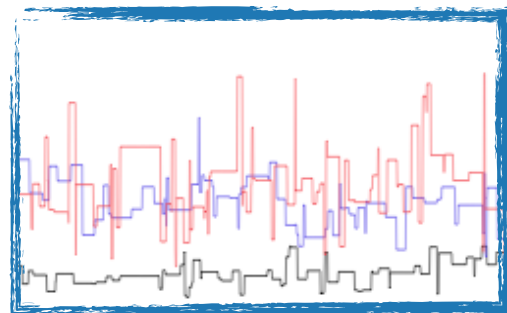
Possible scenarios

Beast analysis

Initialisation failed

Start likelihood: −Infinity after 1000 initialisation attempts
Fatal exception: Could not find a proper state to initialise. Perhaps try another seed.
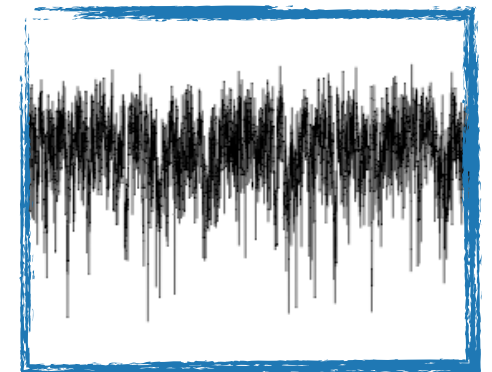P(posterior) = −Infinity (was −Infinity)

Nothing mixed

One parameter did not mix

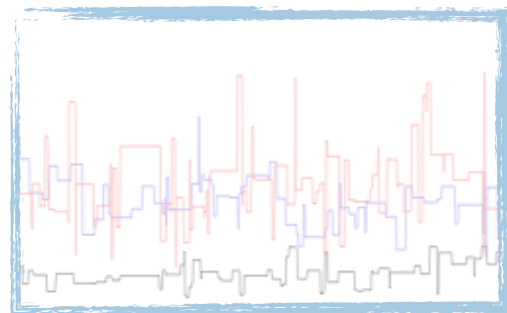|		
kappa.noncoding	13.143	191
kappa.1stpos	6.28	376
kappa.2ndpos	8.643	372
kappa.3rdpos	27.988	92
mutationRate.noncodi...	0.347	273
mutationRate.1stpos	0.459	238
mutationRate.2ndpos	0.185	237

Everything mixed

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Failed initialisation

Start likelihood: -Infinity after 1000 initialisation attempts
Fatal exception: Could not find a proper state to initialise. Perhaps try another seed.
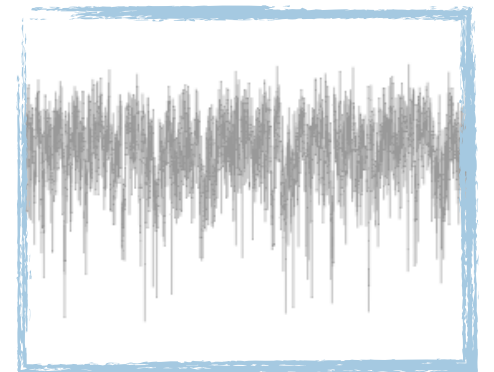
P(posterior) = -Infinity (was -Infinity) P(prior) = -Infinity (was -Infinity)
  P(BDMM) = -Infinity (was -Infinity)
    P(R0Prior) = -0.5586849541070393 (was -0.5586849541070393)
    P(rPrior) = -11.46042136866474 (was -11.46042136866474)
    P(rateMatrixPrior) = -0.1408802549981485 (was -0.1408802549981485)
    P(samplingProportionPrior) = -10.049507225748343 (was -10.049507225748343)
    P(becomeUninfectiousRatePrior) = -0.7811241751317991 (was -0.7811241751317991)
java.lang.RuntimeException: Could not find a proper state to initialise. Perhaps try another seed.
at beast.core.MCMC.run(Unknown Source)
at beast.app.BeastMCMC.run(Unknown Source)
at beast.app.beastapp.BeastMain.<init>(Unknown Source)
at beast.app.beastapp.BeastMain.main(Unknown Source)
at beast.app.beastapp.BeastLauncher.main(Unknown Source)

Fatal exception: Could not find a proper state to initialise. Perhaps try another seed.

BEAST has terminated with an error. Please select QUIT from the menu.

Parameter prior is -Infinity

Example: P(rateMatrixPrior) = -Infinity (was -Infinity)

Possible solutions:

✓ Increase initialisation attempt number;

✓ Adjust initial conditions;

✓ Use excludable priors;

✓ Check for silly/incompatible priors;

✓ Check for underflow (too low values);

✓ Talk to the BEAST2 support group!

Model prior is -Infinity

Example: P(BDMM) = -Infinity (was -Infinity)

Possible solutions:

✓ Talk to your colleagues;

✓ Talk to the BEAST2 support group;

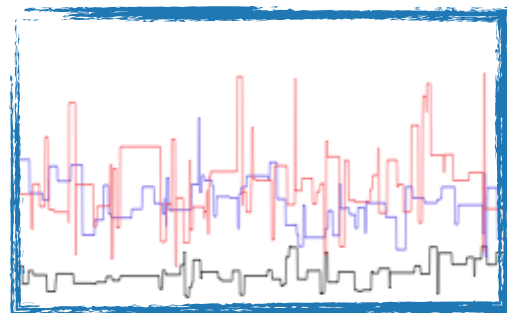✓ Talk to the developers of the particular model.

Possible scenarios
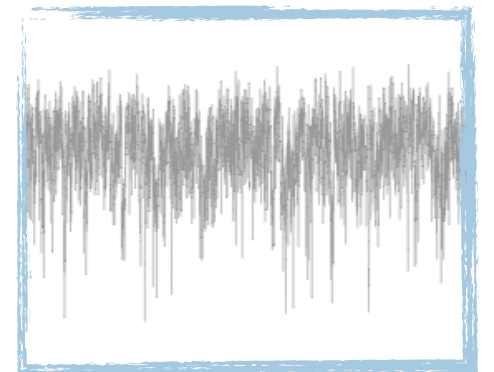
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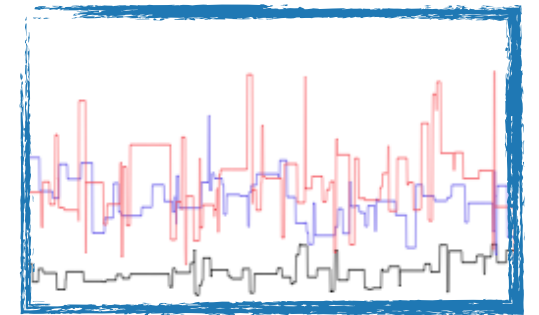P(posterior) = −Infinity (was −Infinity)

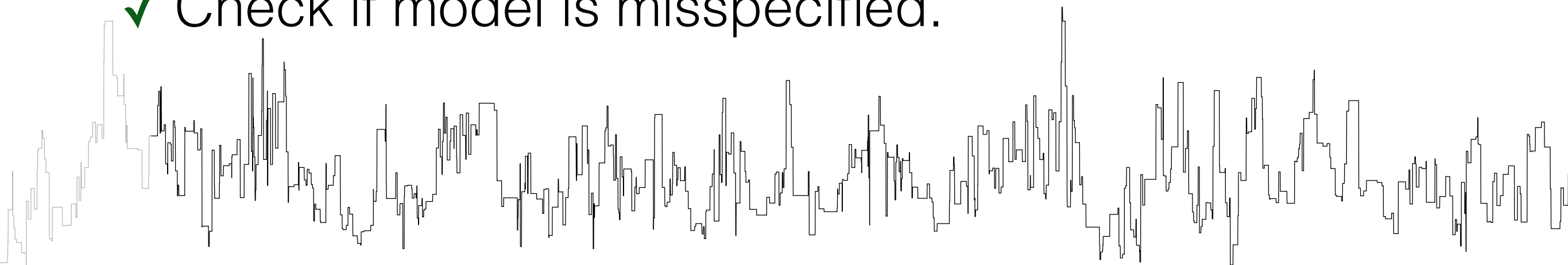## Everything mixed

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Possible solutions:

✓ Increase chain length;

✓ Run multiple independent chains;

✓ Increase sampling frequency (if ACT permits);

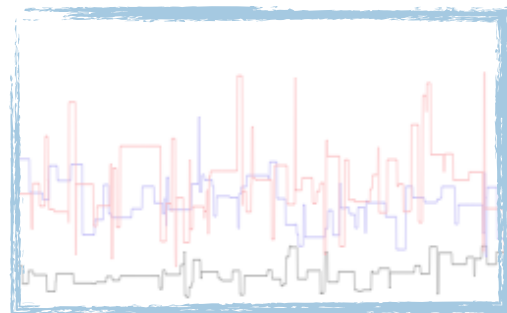✓ Check identifiability;

✓ Check if model is misspecified.

Possible scenarios

Beast analysis

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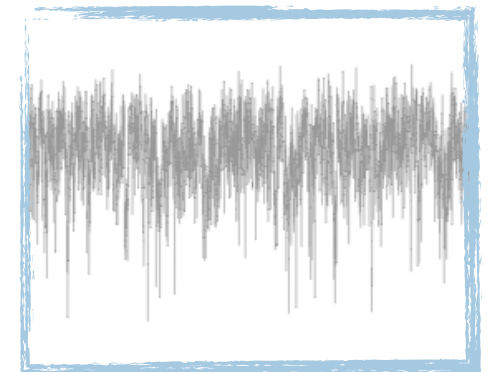P(posterior) = −Infinity (was −Infinity)

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Possible solutions:

✓ Tweak the operator weights:

   ✓ Increase weight for low ESS parameters;

   ✓ Use UpDown operator for correlated parameters;

✓ Run longer (or combine several independent chains).

Only posterior not mixed

Possible reasons:

- Tree prior cares too much about a parameter the data says nothing about;

- Also one can always make a statistic that doesn't mix.

Tree space mixing
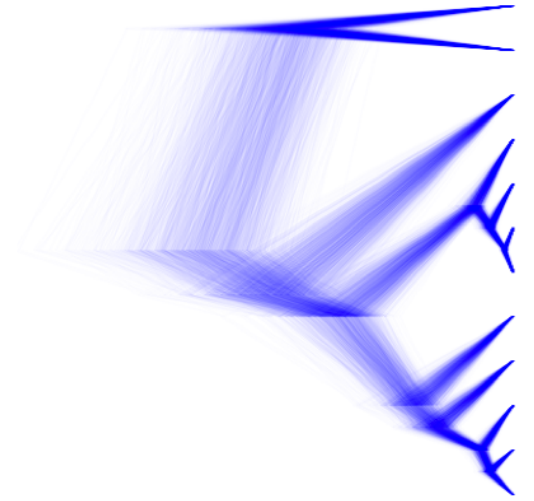
Bad news:

At the moment we can not directly examine the ESS of the trees;

Good news:

Good mixing of the continuous parameters and likelihoods is indicative;

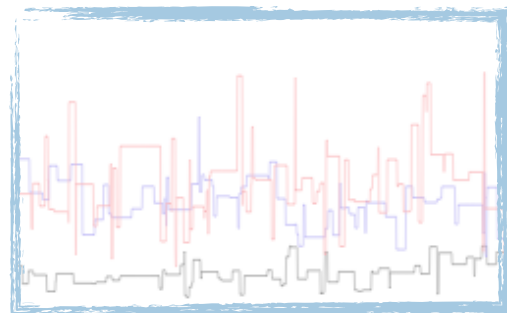Can also use AWTY to see if the clade probabilities stabilised.

Possible scenarios

Beast analysis

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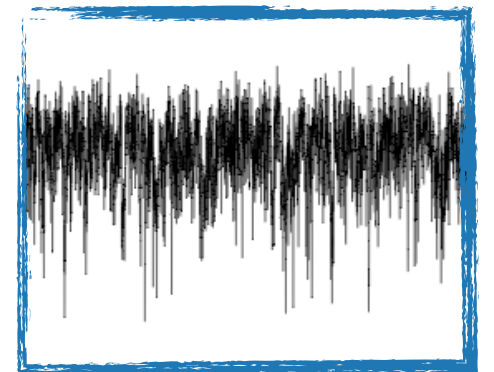P(posterior) = –Infinity (was –Infinity)

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Everything mixed

Sanity check:

- Sampling from prior.

Good news:

Bayesian analysis always gives an answer!

Bad news:

The answer is how uncertain we are.

Troubleshooting time!

taming-the-beast.org/tutorials/Troubleshooting/