Demographic Inference with Admixture CoalHMM

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Supervisor: Thomas Mailund

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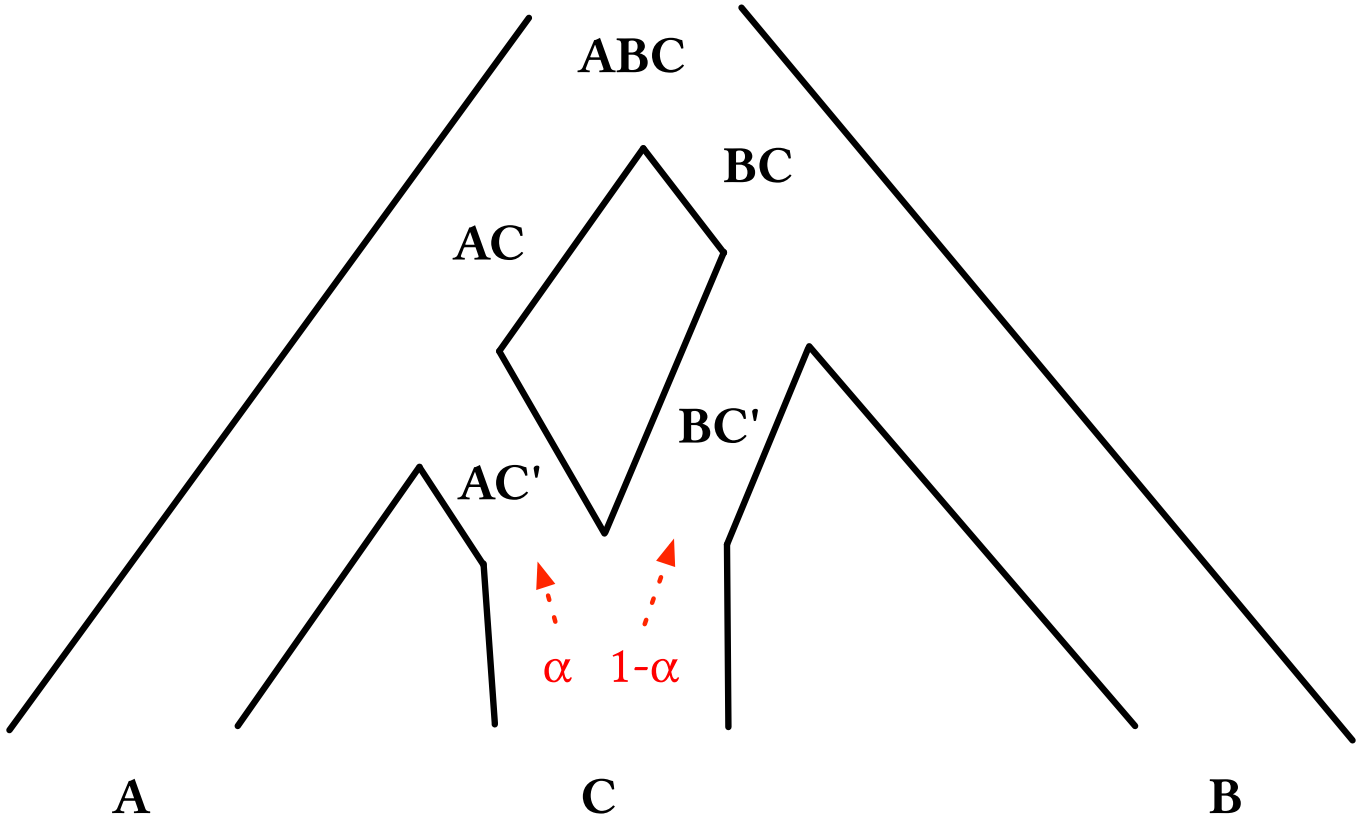
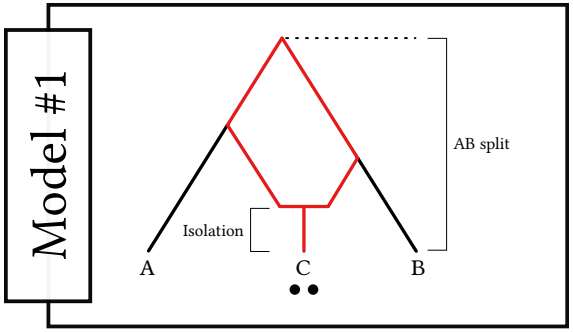
General Admixture Demographic Scenario

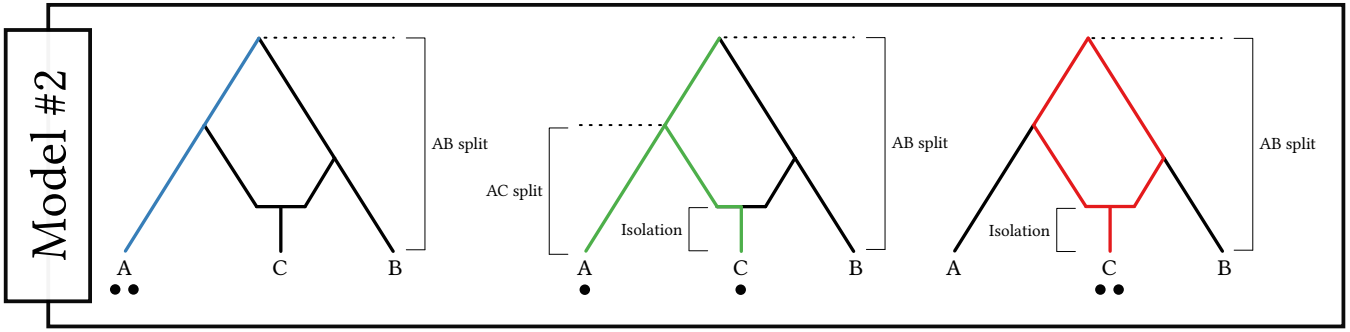


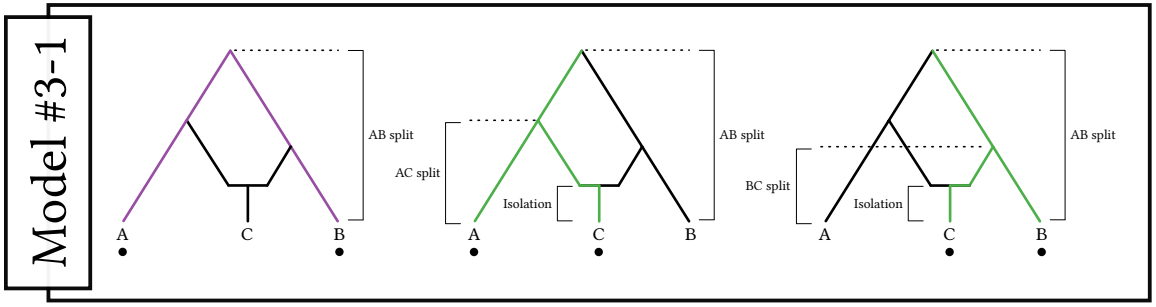
Admixture CoalHMM Models

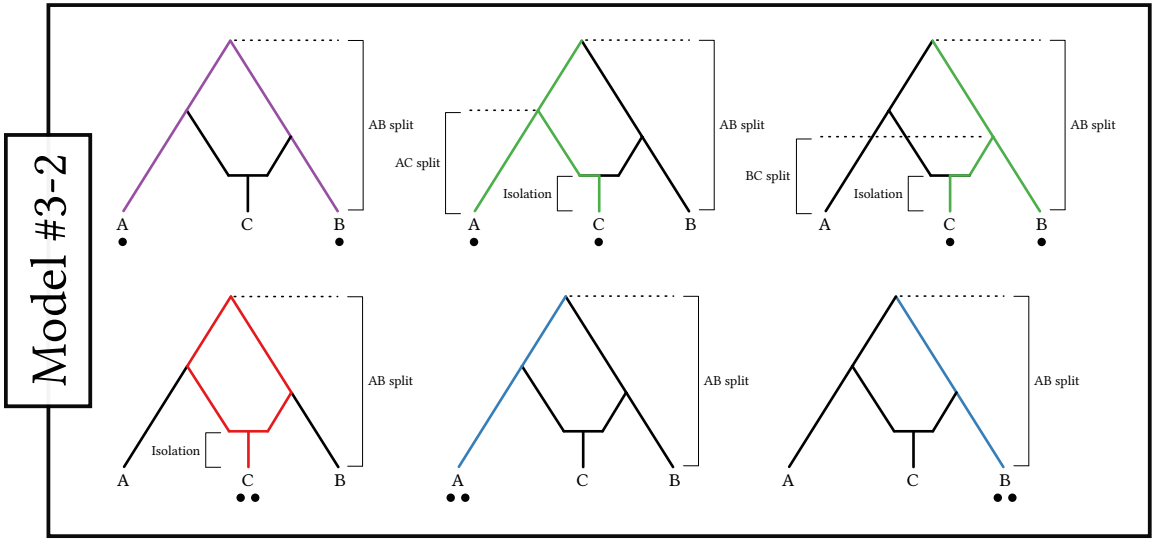
Model \ Population	A	B	C	Samples per population
#1	✗	✗	✓	● ●
#2	✓	✗	✓	● ●
#3-1	✓	✓	✓	●
#3-2	✓	✓	✓	● ● One pair per configuration
#3-3	✓	✓	✓	★ ● All pairwise

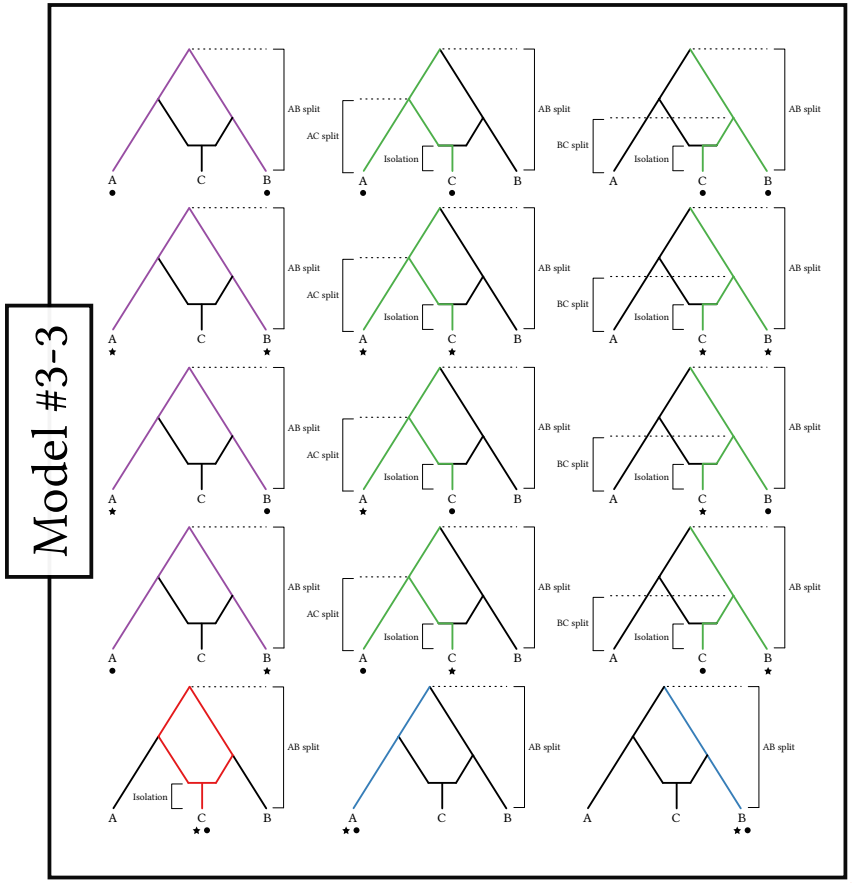
Admixture CoalHMM Model HMMs





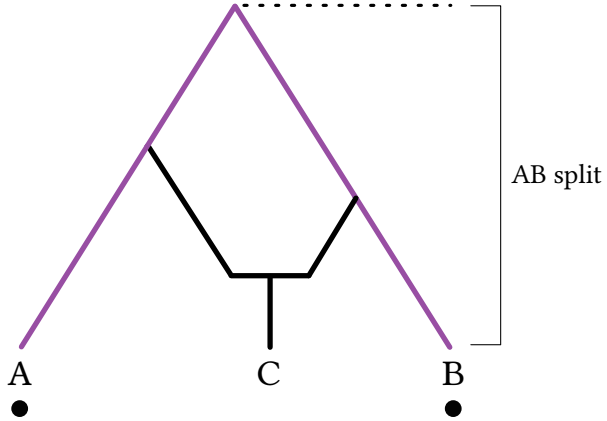


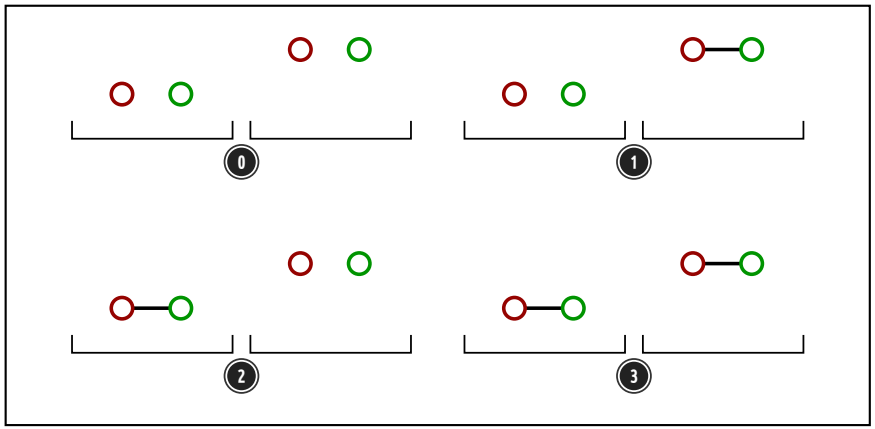


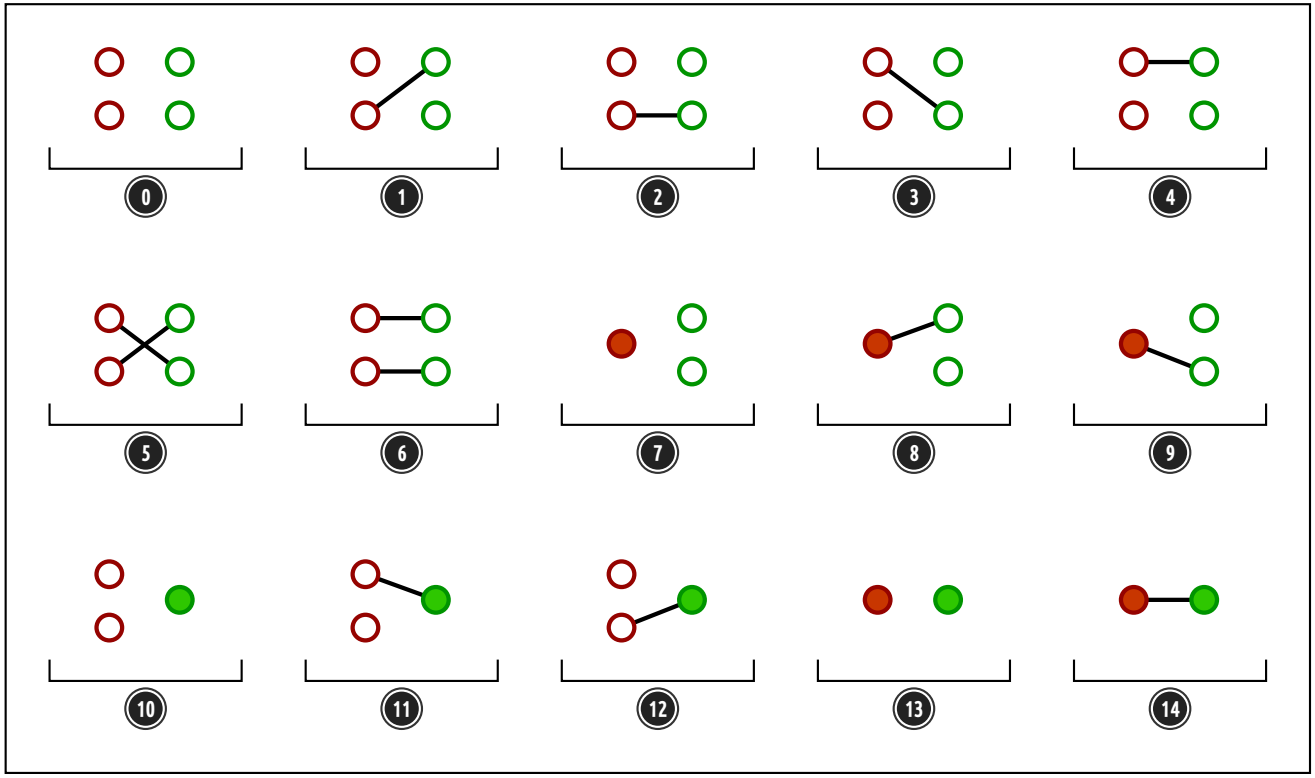


Jade Cheng · BiRC · Aarhus University · September 09, 2015

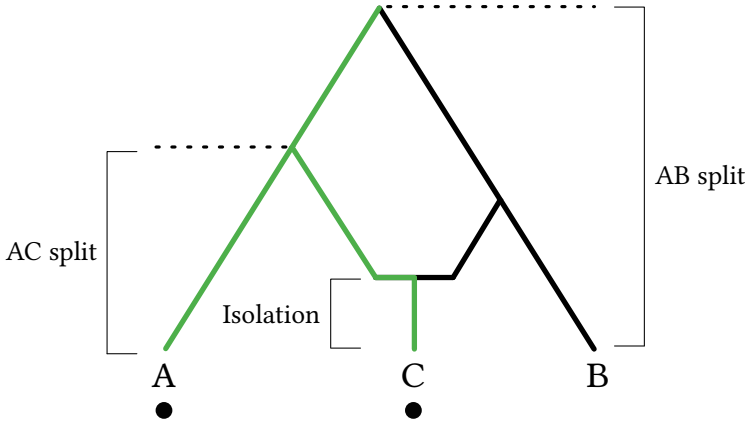
CTMCs for HMM

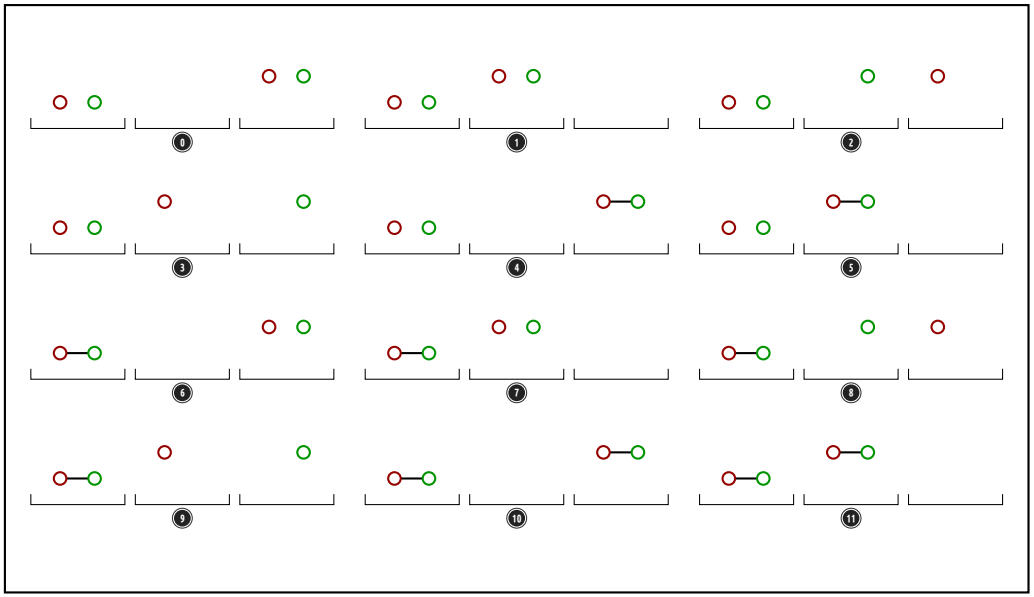


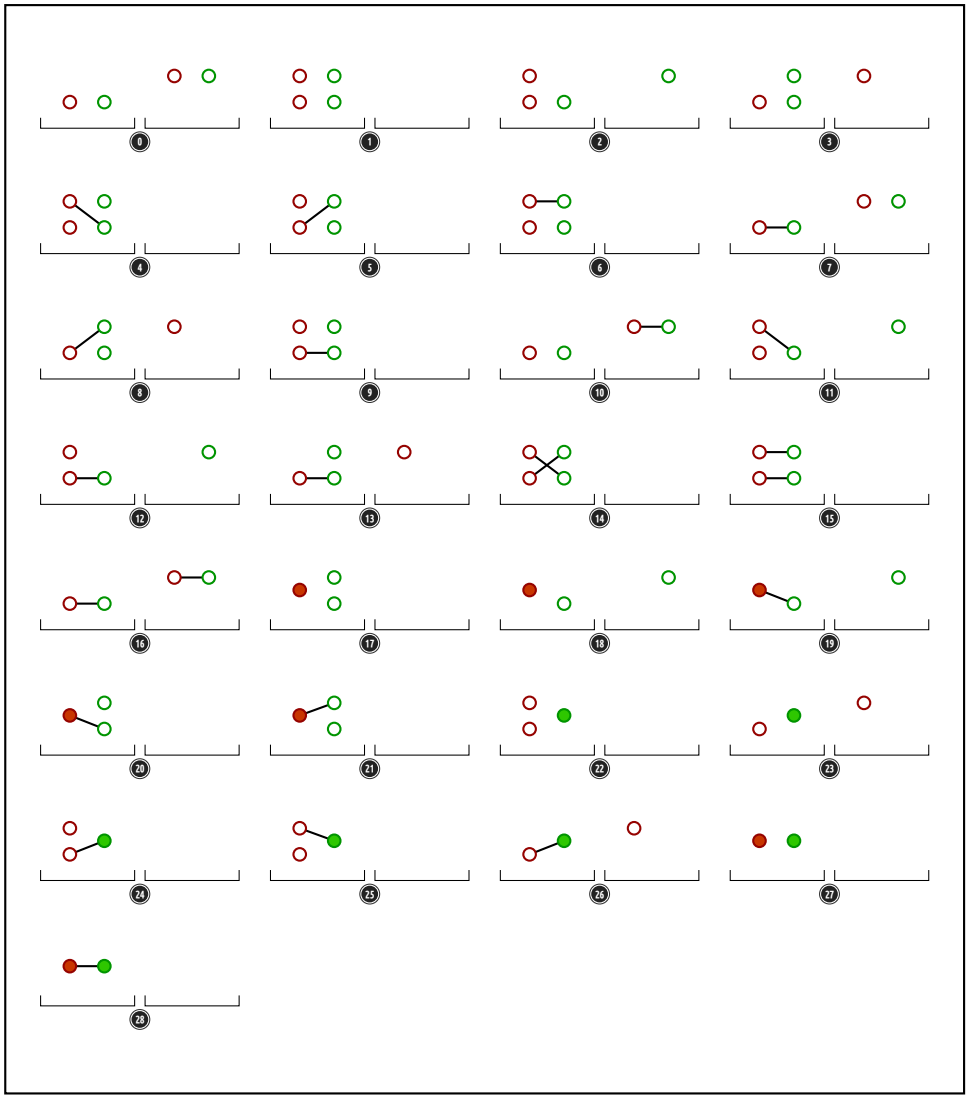




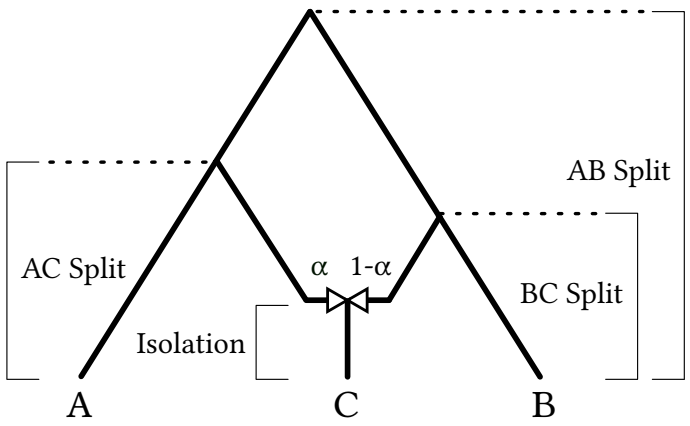
CTMCs for HMM

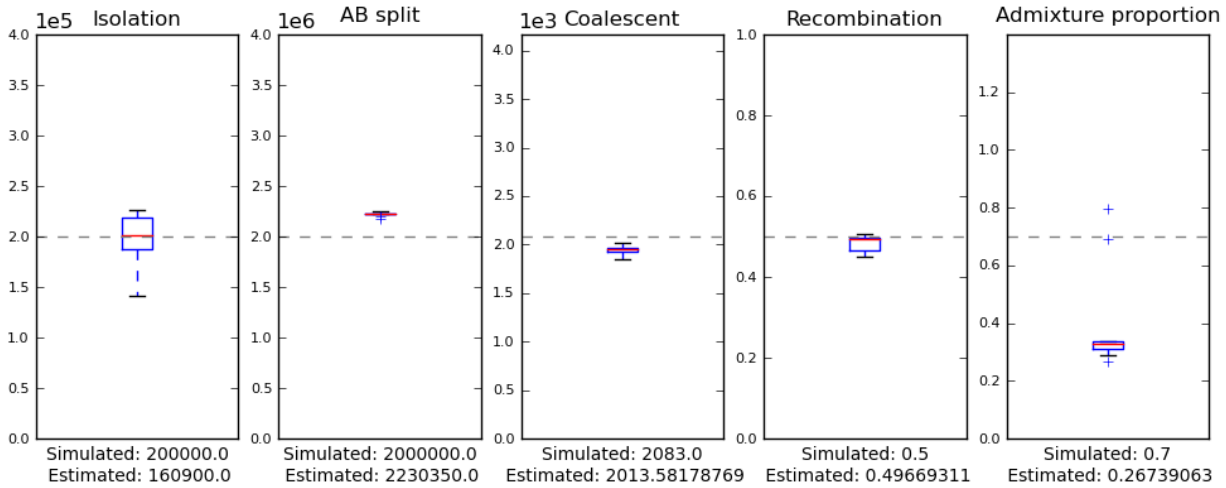




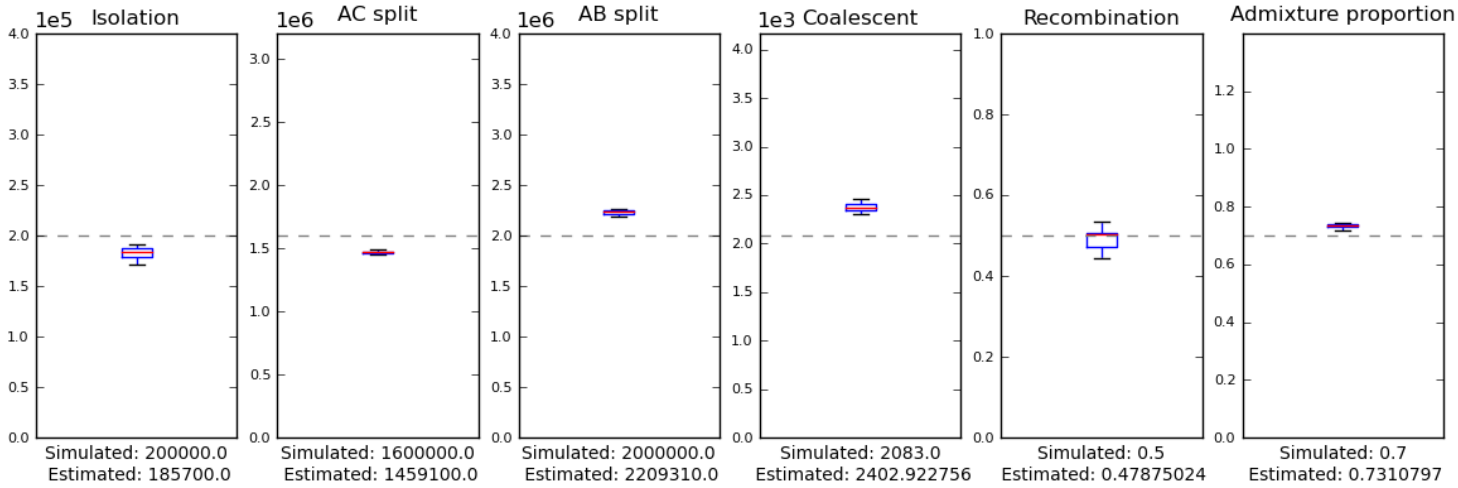


Admixture CoalHMM Estimates - Distant Events





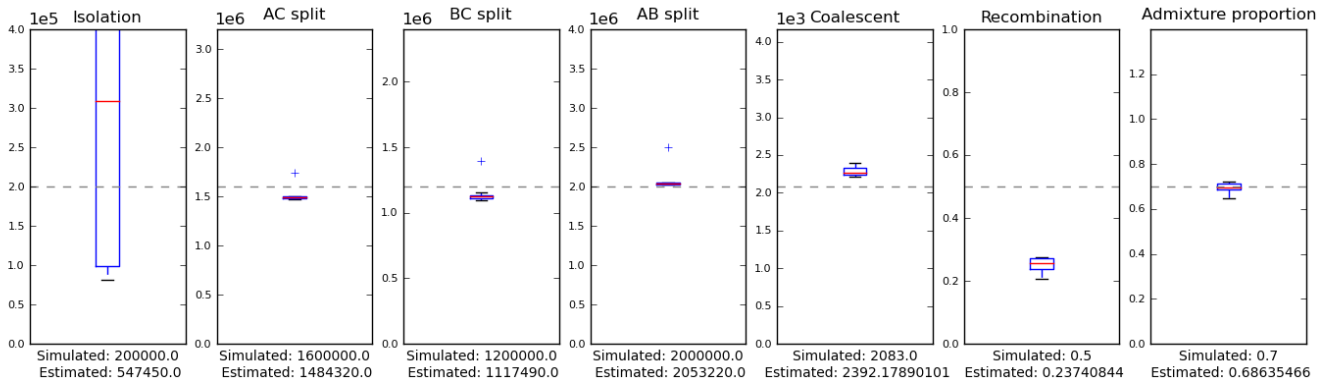
Model #1: admixed population · 1 HMM



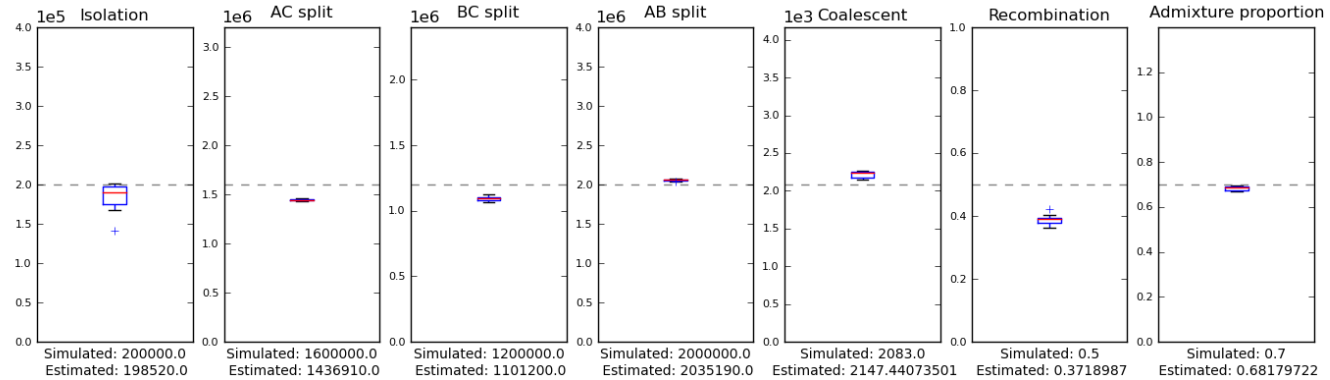
Model #2: admixed population and one source population · 3 HMM

Admixture CoalHMM Estimates - Distant Events

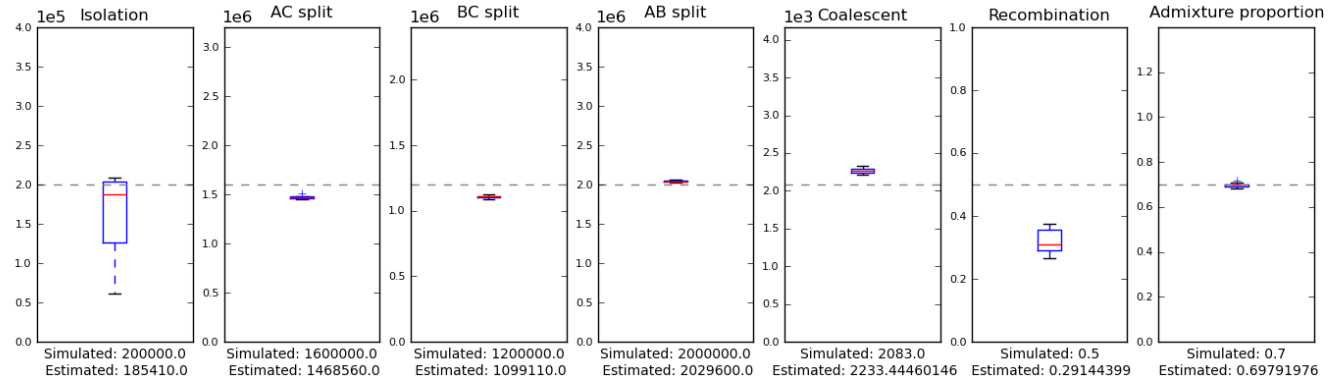
Model #3-1:
all three populations
3 HMM



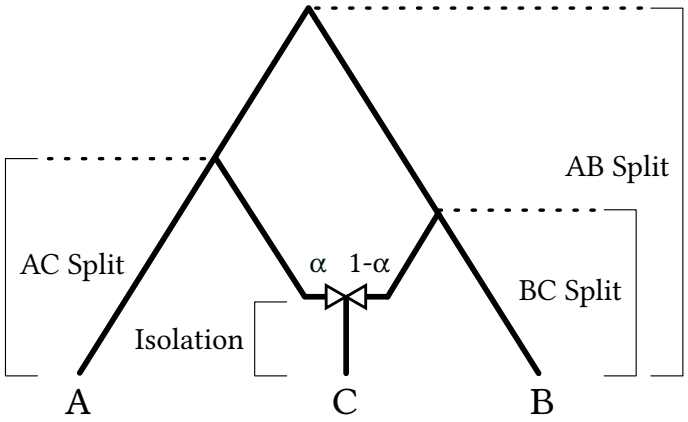
Model #3-2:
all three populations
6 HMM

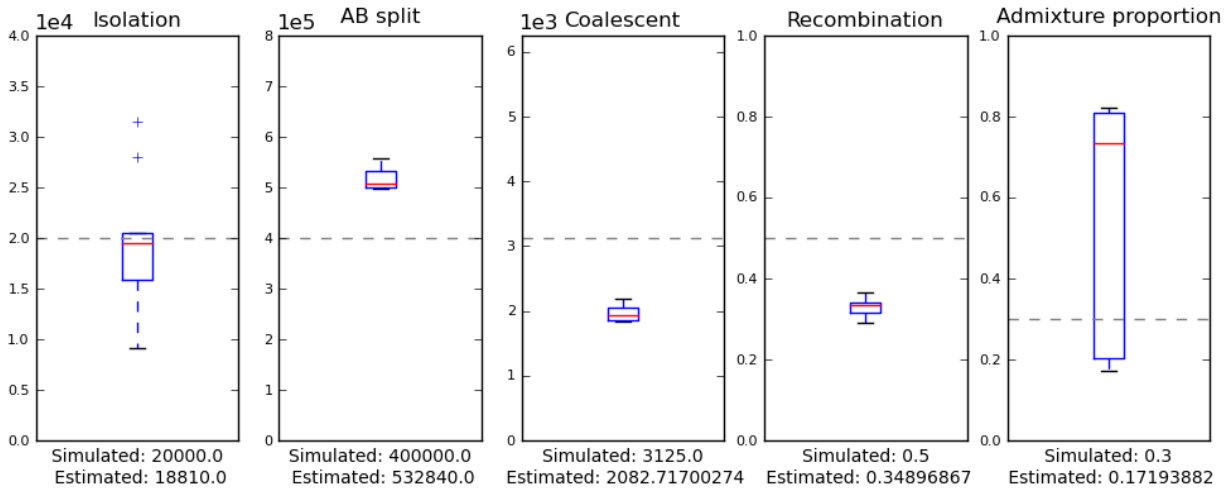


Model #3-3:
all three populations
15 HMM

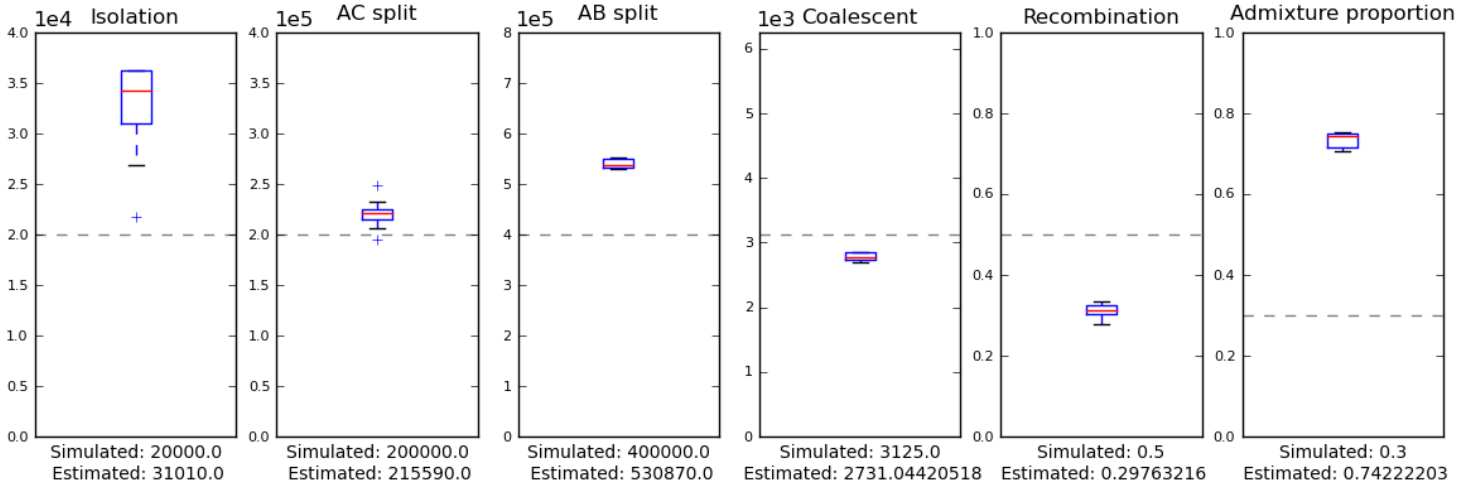


Admixture CoalHMM Estimates - Recent Events





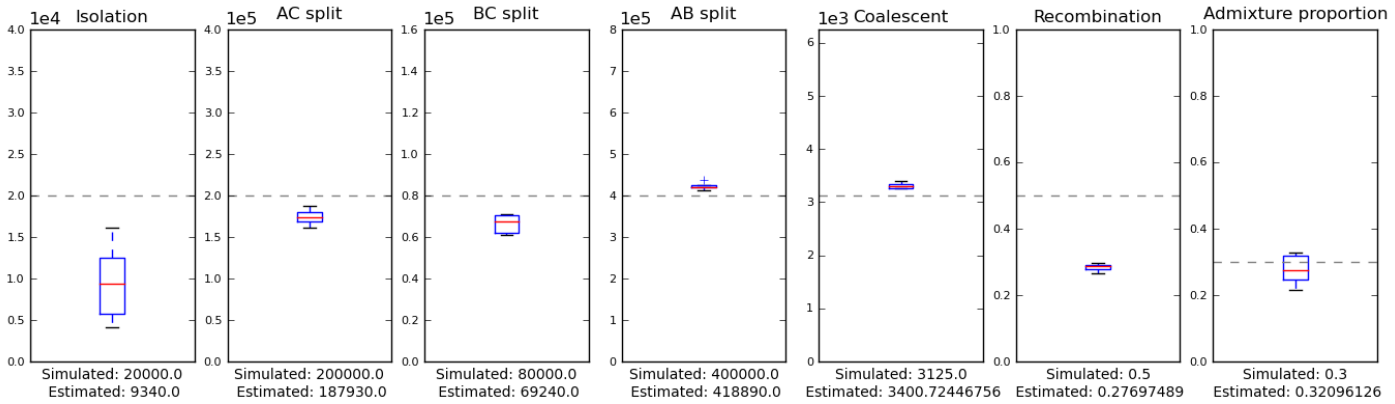
Model #1: admixed population · 1 HMM



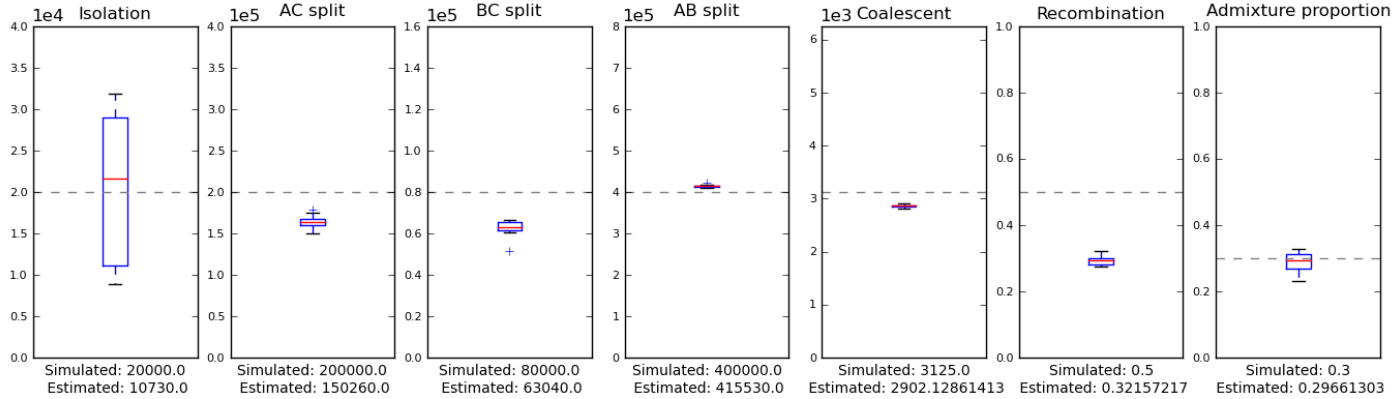
Model #2: admixed population and one source population · 3 HMM

Admixture CoalHMM Estimates - Recent Events

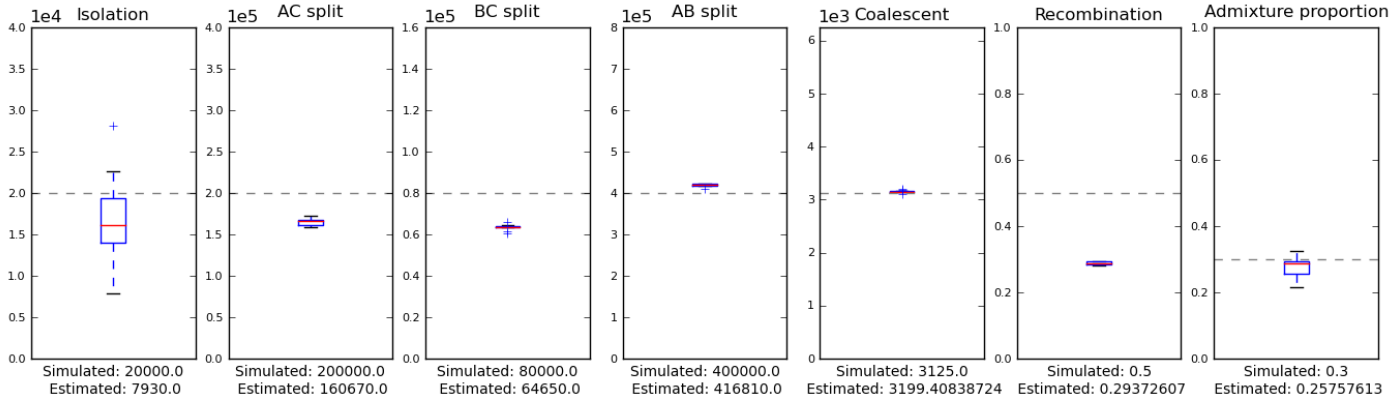
Model #3-1:
all three populations
3 HMM



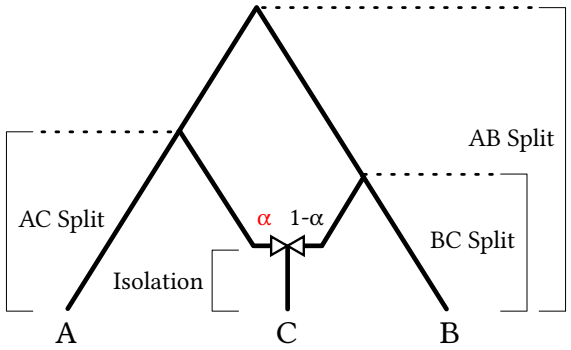
Model #3-2:
all three populations
6 HMM

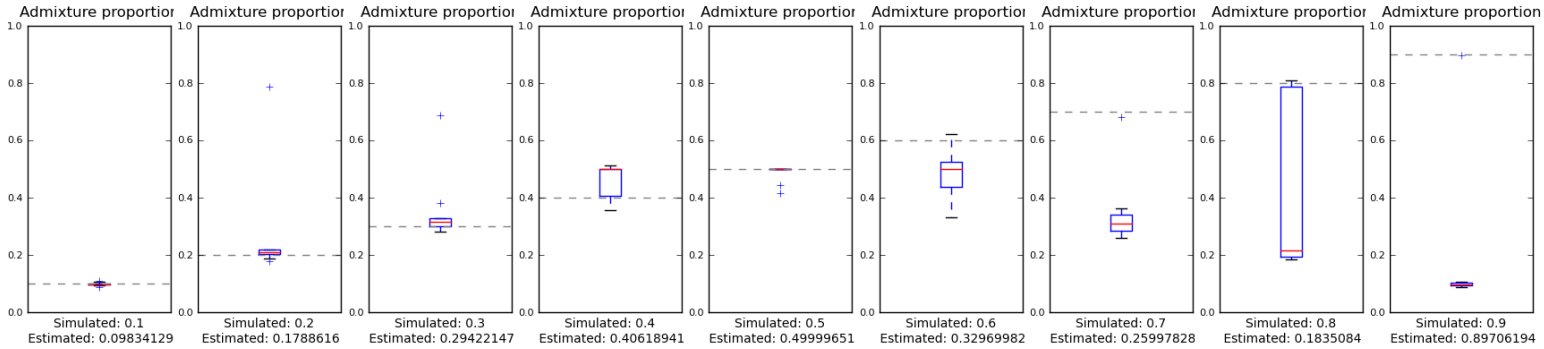


Model #3-3:
all three populations
15 HMM

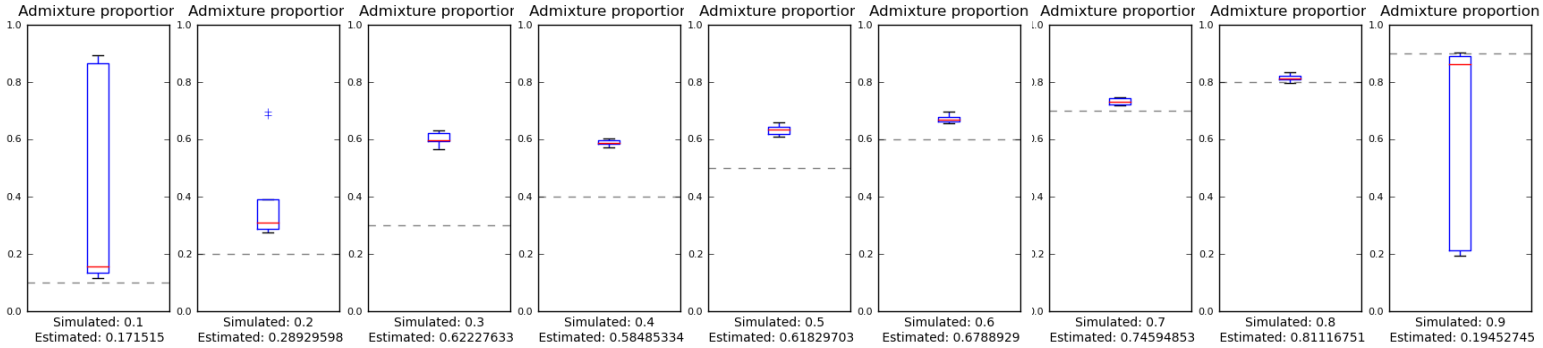


Admixture CoalHMM Estimates - Admixture



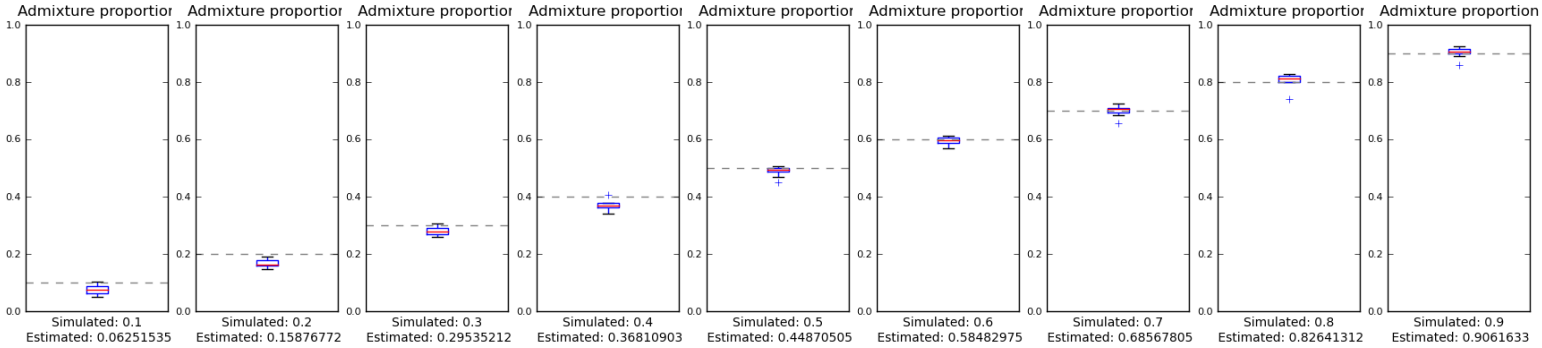


Model #1: admixed population · 1 HMM

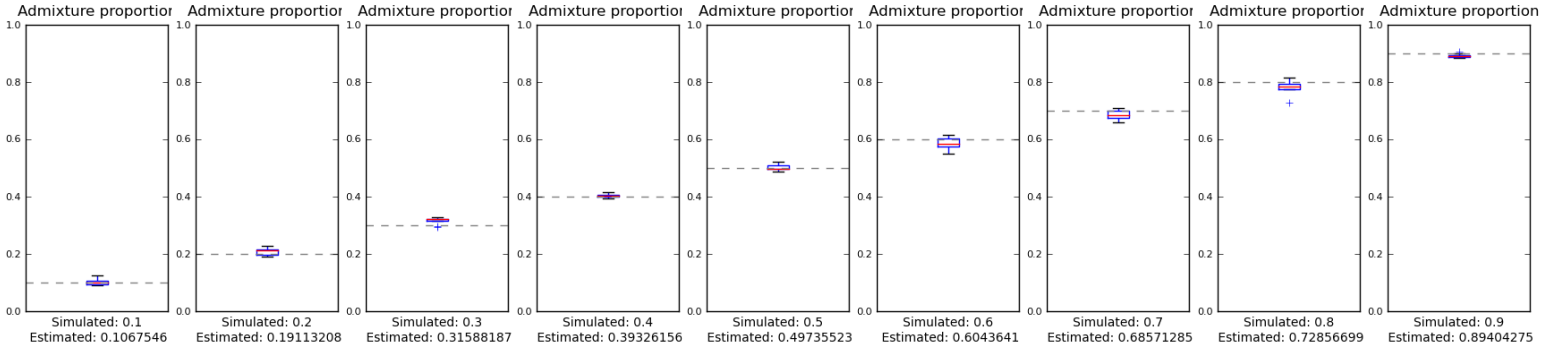


Model #2: admixed population and one source population · 3 HMM

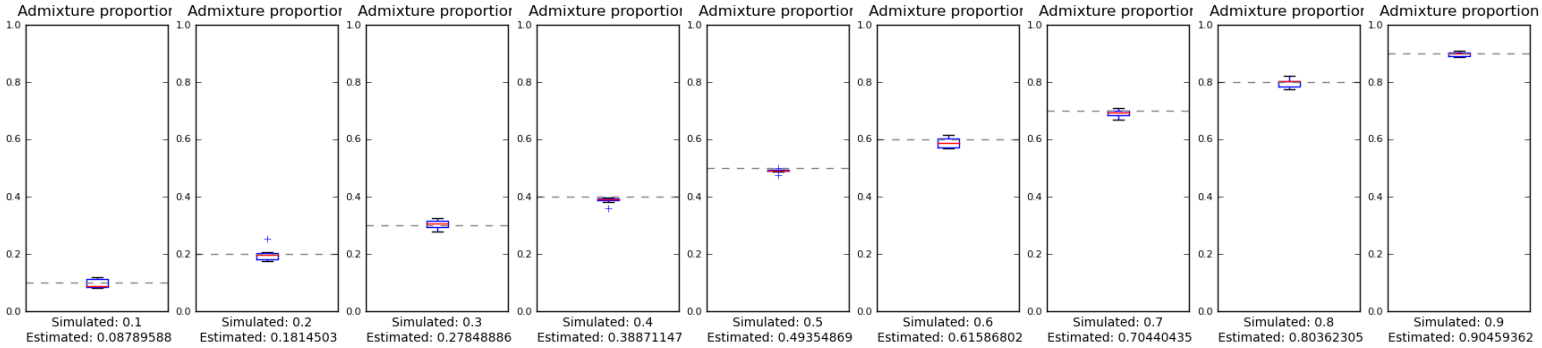
Admixture CoalHMM Estimates - Admixture



Model #3-1: all three populations · 3 HMM

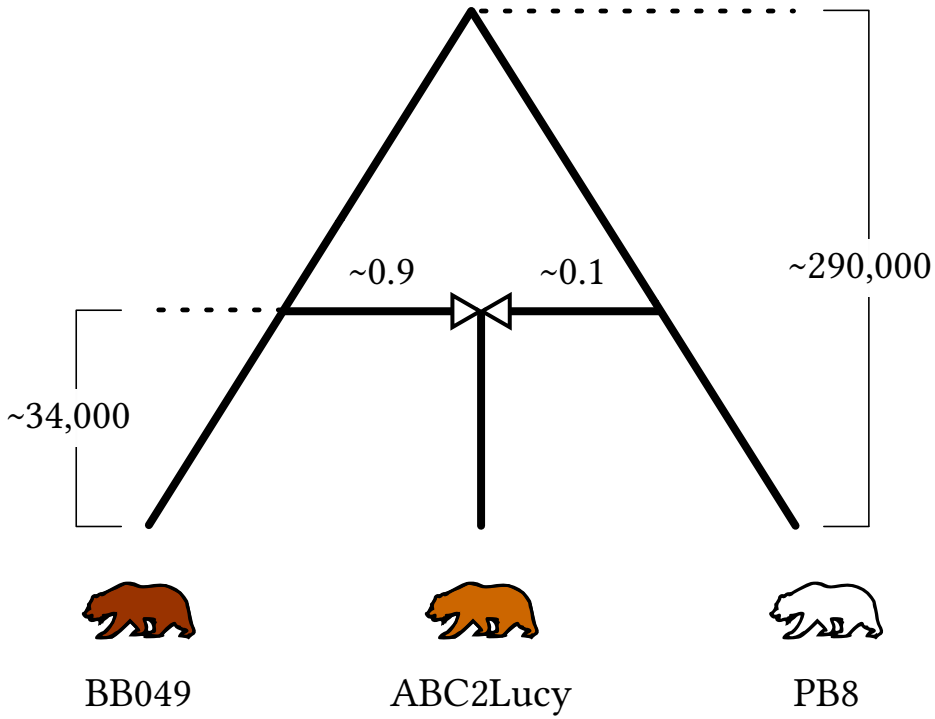


Model #3-2: all three populations · 6 HMM

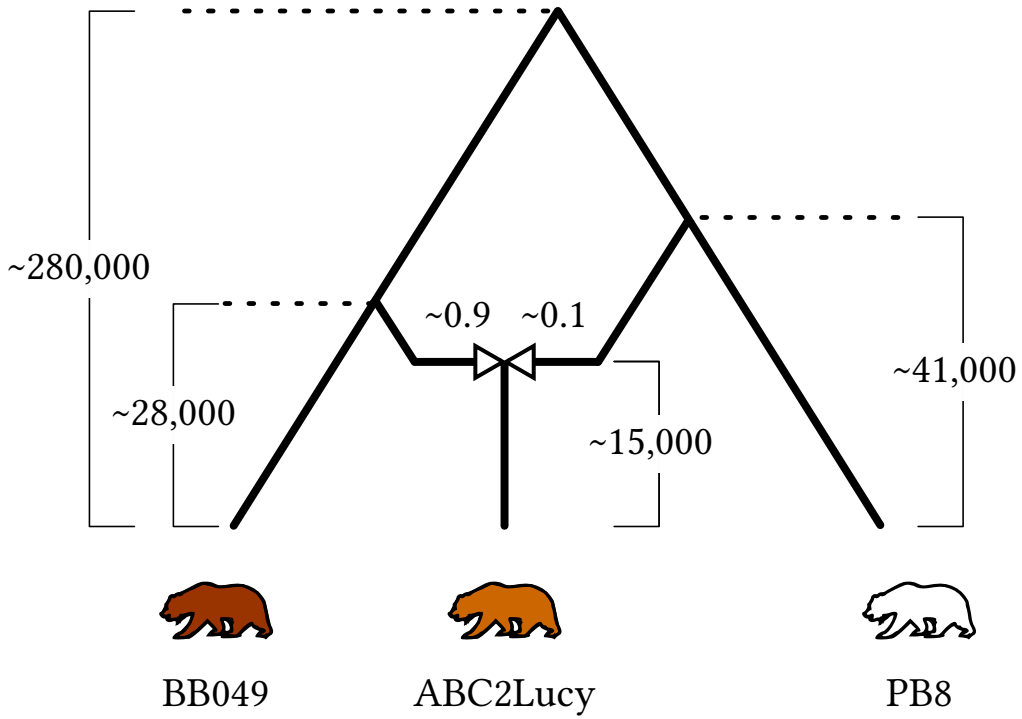


Model #3-3: all three populations · 15 HMM

Admixture CoalHMM Estimates - Bears



One-time admixture scenario



General admixture scenario