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Gleb Zhelezov* (gzhelezov@unm.edu). *Inferring trait evolution.*

Trait evolution is frequently understood as a gradual process, where diverging species accumulate differences over the course of millions of years. However, the fossil record contains evidence of short periods of rapid evolution, followed by very long periods of stasis. This mode of evolution is referred to as punctuated evolution. We present a method which uses trait measurements from present-day species and the topology of their evolutionary tree to localise the positions (with uncertainties) of these shifts, their typical size, and the typical strength of the associated bounded evolution. This is accomplished by iterating over all possible pulse positions (deterministically or using a Monte Carlo method, depending on the tree size), finding the maximum likelihood parameters conditioned on each configuration of pulses (accomplished quickly via several approximations), and then choosing that pulse configuration which has the greatest entropy. We present examples of detected pulsed trait evolution in new and existing datasets of both physical and social traits, including evidence of punctuated evolution in a social signalling trait of East African sunbirds. (Received August 25, 2021)