

# CHARACTERIZING PHYLOGENETIC TREE INDICES THROUGH AVERAGE COALESCENT TIMES

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Values associated with phylogenetic trees like the total tree area [4] or the cophenetic index [5] can be defined recursively. Then, through solving appropriate recursive equations, one can, e.g., find the moments of the index. However, the above indices can be alternatively represented through the height of the tree,  $T$ , and the time to coalescent of a random pair of tips,  $\tau$ . In this way the given index can be studied by considering a pair of (dependent) random variables. In the talk we will consider this approach for the cophenetic index [6], and the total tree area [1]. Furthermore, knowledge of the joint Laplace transform,  $E[e^{-xT-y\tau}]$  [2], allows for investigating higher moments. In the Yule case, through this representation we associate a submartingale with the cophenetic index [3], obtaining elegant asymptotics.

## References

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