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Rik Sengupta* (rsengupt@princeton.edu), 0758 Frist Campus Center, Princeton University, Princeton, NJ 08544. *On tree rotations and common parse words.*

A proper 3-coloring of the $2n - 1$ vertices of a complete binary tree T with n leaves using the letters $\{0, 1, 2\}$ so that no two siblings receive the same color is called a *labeling* of T . For such a labeling, the labels on the leaves can be read off in order, and this gives a word *parsed* by T . We examine the number of common parse words of pairs of trees separated by small distances in the rotation graph R_n for binary trees with n leaves. To this end, we fix some tree T^* and define the function $f(T)$ to be the number of common parse words between T and T^* . We prove that $f(T)$ behaves extremely nicely when T and T^* are within small distances in R_n . Our results give rise to a natural conjecture that immediately implies the Four Color Theorem by using an equivalence established by Kauffman (1990). (Received September 10, 2011)