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Kai Zheng* (kzheng@princeton.edu). *On the e -positivity of trees and spiders.*

We prove that the chromatic symmetric function of any tree with a vertex of degree at least six is not e -positive, that is, it cannot be written as a nonnegative linear combination of elementary symmetric functions. This makes significant progress towards a recent conjecture of Dahlberg, She, and van Willigenburg, who conjectured the result for the chromatic symmetric functions of all trees with a vertex of degree at least four. We also provide a series of conditions that can identify when the chromatic symmetric function of a spider, a tree consisting of multiple paths identified at an end, is not e -positive. These conditions generalize to trees and graphs with cut vertices as well. Finally, by applying a result of Orellana and Scott, we provide a method to inductively calculate certain coefficients in the elementary symmetric function expansion of the chromatic symmetric function of a spider, leading to further e -positivity conditions for spiders. (Received August 31, 2020)