NON-ESCAPING ENDPOINTS OF ENTIRE FUNCTIONS

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Abstract: Let $f_a(z) = exp(z) + a$, $a < -1$. The Julia set of f_a consists of an uncountable union of disjoint curves going off to infinity (a Cantor bouquet). Following several interesting results on the endpoints of these curves, we consider the set of non-escaping endpoints, that is, the endpoints whose iterates do not tend to infinity. We show that the union of non-escaping endpoints with infinity is a totally separated set. This is a complementary result to the very recent result of Alhabib and Rempe-Guillen that for the same family of functions the set of escaping endpoints together with infinity is connected. The key ingredient for our result is to show that a suitable set has a topological structure called a "spider's web". Finally, we present a larger class of functions in the exponential family as well as a function that was first studied by Fatou which share the same property of the non-escaping endpoints.