JL-colorings on general graphs

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It is well known that the greatest number of colors appearing in a rainbow-cycle-forbidding edge coloring of a connected graph on n vertices is $n-1$. Such an edge coloring is known as a JL-coloring. In previous work it has been shown that for graphs in certain classes, these colorings are all obtainable in a certain way that permits classification: for instance, it is known that the essentially different colorings of K_n with $n > 1$ are in one-to-one correspondance with isomorphism classes of full binary trees with n leafs. We have defined a Standard Construction for JL-colorings (which we derived from the previous results) and we have shown that any JL-coloring of a connected graph is produced by this Standard Construction. Furthermore, every JL-coloring has a monochromatic edge cut. We also state some results on the sharpness of this result: specifically, what can we say about the number of colors used in an edge coloring that forbids rainbow cycles and monochromatic cuts.

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