Intersecting many longest paths in a connected graph

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(joint work with J. Ekstein, S. Fujita, A. Kabela)

In my talk, I will present a progress on a conjecture concerning intersection of longest paths in a connected graph.

It is easy to see that in a connected graph any 2 longest paths have a vertex in common. For $k \geq 7$, Skupień obtained a connected graph in which some k longest paths have no common vertex, but every $k - 1$ longest paths have a common vertex. It is not known whether every 3 longest paths in a connected graph have a common vertex and similarly for $4, 5$, and 6 longest path. S. Fujita et al. found an upper bound on distance among 3 longest paths in a connected graph. We proved a similar upper bound on distance between 4 longest paths and also for k longest paths, in general.