On the strongest form of a theorem of Whitney for hamiltonian cycles in plane triangulations

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We investigate hamiltonian cycles in triangulations. The central part of the talk is the search for the strongest possible form of Whitney's theorem about hamiltonian triangulations in terms of the decomposition tree defined by separating triangles. Jackson and Yu showed that a triangulation is hamiltonian if this decomposition tree has maximum degree 3. We will decide on the existence of non-hamiltonian triangulations with given decomposition trees for all trees except trees with exactly one vertex with degree $k \in \{4, 5\}$ and all other degrees at most 3. For these cases we show that it is sufficient to decide on the existence of non-hamiltonian triangulations with decomposition tree $K_{1,4}$ or $K_{1,5}$, and we give several restrictions on the structure of such non-hamiltonian triangulations. These results were obtained using a combination of computational results and theoretical results, and both will be explained.