On the minimum entropy for irreducible interval cycles

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The class $\mathcal{C}_n$ of interval cycles of period n can be divided into two disjoint families $\mathcal{R}_n \cup \mathcal{I}_n$. A cycle P belongs to $\mathcal{R}_n$ and is called *reducible* if there exists an underlying cycle Q whose period $k > 1$ divides n such that P is obtained from expanding any point of Q to a block of n/k points and the blocks are cyclically permuted according to Q. On the other hand, a cycle belongs to $\mathcal{I}_n$ and is called *irreducible* if it is "genuine" in the sense that it cannot be obtained from a cycle of smaller period after replacing points by blocks. The cycles with minimum entropy in $\mathcal{C}_n$ are well known, since they have to be *primary* (forcing minimal) and the primary interval cycles are completely characterized in the literature. When n is odd, the entropy-minimal n-cycles are Stefan cycles, in particular irreducible. But for n even they turn out to be reducible. So, finding the cycles of minimum entropy in the class $\mathcal{I}_n$ for n even is a natural (and open) problem. For any n even we define an irreducible unimodal cycle P_n and prove that P_n is primary in $\mathcal{I}_n$. It follows that P_n minimizes the entropy in the set (contained in $\mathcal{I}_n$) of unimodal irreducible cycles of period n. We conjecture that P_n has in fact the minimum entropy in the whole class $\mathcal{I}_n$.