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ORDER POLYTOPES OF CROWN POSETS

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In the last decade, the order polytope of the zigzag poset has been thoroughly studied. A related poset, called *crown poset*, obtained by adding an extra relation between the endpoints of an even zigzag poset, is not so well understood. We study the order polytopes of crown posets. We provide explicit formulas for their f-vectors. Also, we provide recursive formulas for its Ehrhart polynomial, giving a counterpart to formulas found in the zigzag case by Petersen–Zhuang (2025); we use these formulas to simplify a computation by Ferroni–Morales–Panova (2025) of the linear term of the order polynomial of these posets. Furthermore, we provide a combinatorial interpretation for the coefficients of the h^*-polynomial in terms of the cyclic swap statistic on cyclically alternating permutations, which provides a circular version of a result by Coons–Sullivant (2023).

This is a joint work with Teemu Lundström.