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Stephen D Smith* (smiths@uic.edu), 728 Wisconsin Ave, Oak Park, IL 60304. *Some remarks on unitary posets.* Preliminary report.

For a prime $p \geq 7$, certain unitary groups $U_n(q)$ with $p|(q+1)$ are the obstacle to fully generalizing the 1993 Aschbacher-Smith work on Quillen's Conjecture.

That conjecture requires that when $O_p(G) = 1$, the poset $\mathcal{A}_p(G)$ of nontrivial elementary p -subgroups should have its order complex (i.e., of inclusion-chains) non-contractible. The Aschbacher-Smith work in effect reduces to a more specialized conjecture: of "Quillen dimension", for G given by the above unitary groups (perhaps with outer automorphisms)—namely that homology should be nonzero in the top dimension $m_p(G) - 1$.

Indeed because $p|(q+1)$, elementary p -subgroups act diagonally on the underlying unitary space V ; so it turns out to suffice for $U_n(q)$ just to exhibit suitable homology for the "unitary poset" of nonzero unitary subspaces of V (or indeed for any subposet \mathcal{F} of the needed dimension).

Of course the number of unitary subspaces of V of each dimension is a polynomial in q ; hence combinatorial invariants such as the Euler characteristic are also polynomials. The talk reports on a few features emerging from a preliminary study of such polynomials, such as divisibility by powers of $q \pm 1$. (Received January 02, 2015)