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Sporadic balanced subgroups

Let $d > 2$ be an integer. Using the standard representatives, any unit mod d lies either in the interval $(0, d/2)$ or $(d/2, d)$. A subgroup H of the group of units mod d is called balanced if every coset of H intersects these two intervals equally. There are two nice families of such subgroups, and a balanced subgroup is called sporadic if it is not included in either family. For a fixed number g , we consider the distribution of $d > 2$ coprime to g for which $\langle g \pmod{d} \rangle$ is sporadic balanced. This relates to a conjecture of Carl Pomerance and Douglas Ulmer.