COVERING EXTENDED BUILDING SETS REVISITED

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Abstract. Covering Extended Building Sets (cov EBSs) have been used to construct a difference set in many groups. In this talk, we consider the question of how many distinct difference sets can be constructed by cov EBSs. We were motivated by the paper by Langevin and Leander who demonstrated that there are precisely 99,270,589,265,934,370,305,785,861,242,880 distinct difference sets in the group $\mathbb{Z}_2^8$ (they stated their result in terms of bent functions). We will construct a bent function using a cov EBS that is outside both the Maiorana-McFarland family and the Partial Spread family and we will discuss possible ways that this method might produce more difference sets than any other known construction.