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Lee weights of $Z/4Z$-codes from elliptic curves

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The first author was supported in part by NSA Grant #MDA904-97-1-0037 and TARP Grant #ARP-006.

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abstract In W1, the second author defined algebraic geometric codes over rings. This definition was motivated by two recent trends in coding theory: the study of algebraic geometric codes over finite fields, and the study of codes over rings. In that paper, many of the basic parameters of these new codes were computed. However, the Lee weight, which is very important for codes over the ring $Z/4Z$, was not considered. In VW, this weight measure, as well as the more general Euclidean weight for codes over $Z/p^l Z$, is considered for algebraic geometric codes arising from elliptic curves.

In this paper, we will focus on the specific case of codes over $Z/4Z$ and we will show how everything works in an explicit example.