1038-94-54   **Sunghyu Han*** (`sunghyu@yonsei.ac.kr`) and **Jon-Lark Kim**. *On self-dual codes over* $\mathbb{F}_5$.
The purpose of this paper is to improve the upper bounds of the minimum distances of self-dual codes over $\mathbb{F}_5$ for lengths $22, 26, 28, 32 - 40$. In particular, we prove that there is no $[22, 11, 9]$ self-dual code over $\mathbb{F}_5$, whose existence was left open in 1982. We also show that both the Hamming weight enumerator and the Lee weight enumerator of a putative $[24, 12, 10]$ self-dual code over $\mathbb{F}_5$ are unique. Using the building-up construction, we show that there are exactly nine inequivalent optimal self-dual $[18, 9, 7]$ codes over $\mathbb{F}_5$ up to monomial equivalence, and construct one new inequivalent optimal self-dual $[20, 10, 8]$ code over $\mathbb{F}_5$ and at least 40 new inequivalent optimal self-dual $[22, 11, 8]$ codes. (Received January 21, 2008)