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Extended Binary Linear Codes from Legendre Sequences

A construction based on Legendre sequences is presented for a doubly-extended binary linear code of length $2p + 2$ and dimension $p + 1$. This code has a double circulant structure. For $p = 4k + 3$, we obtain a doubly-even self-dual code. Another construction is given for a class of triply extended rate $1/3$ codes of length $3p + 3$ and dimension $p + 1$. For $p = 4k + 1$, these codes are doubly-even self-orthogonal.