

Hadamard matrices and spherical designs

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Hadamard codes over finite rings are explored wrt their covering radius for the chinese euclidean distance. Generalized bent sequences, when they exist, provide a lower bound. Upper bounds are obtained by considering a spherical code attached to Hadamard matrices of Butson type. Under mild hypotheses, this code is spherical 2-design, which yields upper bound on its covering radius on the sphere. This bound, in turn, gives an upper bound on the covering radius of the Hadamard codes.