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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PURE MATHEMATICS

Dimension and Bose distance of some BCH codes

by

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Abstract

Bose-Chaudhuri-Hocquenghem (BCH) codes are a prominent subclass of error correction codes, widely used in areas such as telecommunications, memory systems, and digital electronics due to their strong error correction capability and efficient encoding and decoding algorithms. Despite extensive research and practical adoption, determining key parameters of BCH codes, including dimension, minimum distance, and Bose distance of BCH codes in general remains an open problem. These parameters are crucial for understanding and utilizing BCH codes effectively.

In this talk, I will discuss our recent progress on the dimension and Bose distance of BCH codes of length $\frac{q^m-1}{\lambda}$, where q is a prime power, m is a positive integer, and λ is a positive divisor of $q-1$. This includes primitive BCH codes (when $\lambda = 1$) as a special case. Specifically, I will briefly introduce how to determine the dimension and Bose distance of both narrow-sense BCH codes and some non-narrow-sense BCH codes of this length for $m \geq 4$ and designed distance within the range $\left[2, \frac{q^{\lfloor (2m-1)/3 \rfloor + 1}-1}{\lambda}\right]$ by giving some concise formulas. With these formulas, we find some BCH codes with good parameters.

Date : 5 November 2025 (Wednesday)
Time : 2:00p.m.- 3:00p.m.
Venue : Room 5510 (Lift 25 & 26)

All are Welcome!