



Colloquium of mathematics and systems analysis
March 10, 2015, at 15:15 in M1

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"A characterization of all invariant weight functions on a finite Frobenius ring that have the property that all code isometries allow for monomial extension"

It has been apparent since the end of the foregoing century that finite Frobenius rings (and modules) are the adequate alphabets for ring-linear algebraic coding theory. For these, it was proven early that Hamming isometries allow for MacWilliams' Extension Theorem, which means that linear code isometries that preserve the Hamming weight can be monomially extended to the ambient spaces of the codes in question. As non-Hamming weights have played a prominent role in ring-linear coding theory, this talk will start with a question of further importance: given a finite Frobenius ring, can we characterize all weight functions on this ring that allow for monomial extension of all code isometries? This question seemed anything but trivial, however it turned out that it can be answered. Our talk and the paper on which it is based are dedicated to the memory of Alexandr Nechaev, who vastly influenced foundational work in ring-linear coding theory. He died in November 2014.