# The Sixth Algebraic Combinatorics Workshop

Organized by M.Hirasaka, and J.Koolen

October 1, 2005

Date

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Place

Engineering Building 5-405,
Combinatorial and Computational Mathematics Center,
Pohang University of Science and Technology

Program

11:00-11:50 J.M. Yang,
Bounds for 2-exponents of 2-primitive digraphs and related applications

(12:00-13:30 Lunch time)

13:30-14:20 Y.S. Kwon,

Counting some incompatible circular split subsystems

14:30-14:55 H.G. Kang

Semiregular automorphisms of vertex transitive cubic graphs

14:55-15:20 K.J. Kim

On completely transitive codes

(15:20-15:40 Coffee Break)

15:40-16:30 D.Y. Oh

On the codes over poset metrics

16:40-17:30 Kenta Ishikawa

On finite p-groups which have only two conjugacy lengths

After seminar, we plan to have dinner.

Available Devices for Presentation

Only One Black Board.

# Abstracts

## Bounds for 2−exponents of 2−primitive digraphs and related applications

Jeong−Mo Yang

We study the theory of 2−primitive special digraphs(Tournaments, Ministrong connected digraphs, etc.) and find bounds for 2−exponents of them. Also we introduce a concept of ¾−automata and find the optimal strategy to win the Blackout game and verify our algorithm with a computer program in C++ based on our algorithm.

## Counting some incompatible circular split subsystems

Young−Soo Kwon

In this talk, we will count incompatible circular split subsystems on X with jXj = 2m + c such that every split AjB in the subsystem satises jAj = m and jBj = m + c. And, we also count the maximal incompatible circular split subsystems of size i for every i.

## Semiregular automorphisms of vertex transitive cubic graphs

Hanguk Kang

I will introduce the paper "Semiregular automorphisms of vertex−transitive cubic graphs" by Peter Cameron, John Sheehan, Pablo Spiga. We know that the

cubic vertex−transitive graphs have a semiregular automorphism of order greater than one. But, this paper says that there is one of order greater than two for cubic graphs. This paper also contains a conjecture which says that there is a semiregular autotmorphism of order tending to infnity.

## On completely transitive codes

Kijung Kim

I would like to introduce the class of completely transitive codes which seems to be strictly contained in the class of completely regular codes, and the non−existence of completely transitive codes with more than two codewords and error−correcting capacity greater than three.

## On the codes over poset metrics

DongYeol Oh

Let $F_q$ be the finite field with q elements and $F_q^n$ be the vector space of n-tuples of F. Coding theory can be viewed as the study of $F_q^n$ when $F_n^q$ is endowed with the Hamming metric. Let P be a poset on [n] = {1, 2 ,. . . ,n}. Brualdi introduced a new non-Hamming metric on $F_q^n$ which is associated with a poset P. This is called the P-metric or simply the poset metric. In this talk, we survey recent results on codes over poset metrics (simply called poset codes or P-codes). First we review the basic concepts and properties on poset codes.

Next we will give you some results on poset codes; i) the classification of perfect P-codes where P is a crown poset, ii) the classification of posets admitting a given code to be a perfect poset code, and iii) generalization of MacWilliams identity on poset codes.

## On finite p-groups which have only two conjugacy lengths

Kenta Ishikawa

TBA