On systems of linked block designs

M. Muzychuk

A homogeneous system of linked block designs (LBD) was defined by P. Cameron fourty years ago. It consists of a set of fibres $\Omega_1, ..., \Omega_f$ and incidence relations between each pair of fibres such that

(1) each pair Ω_i, Ω_j with its incidence relation form a symmetric block design with parameters (v, k, λ);
(2) given three of the sets, say $\Omega_i, \Omega_j, \Omega_k$, the number of elements α incident with both $\beta \in \Omega_j$ and $\gamma \in \Omega_k$ depends only on whether or not β and γ are incident.

The only infinite series of LBDs known up to now has parameters $v = 2^{2m}, k = 2^{m-1}(2^m \mp 1), \lambda = 2^{m-1}(2^{m-1} \pm 1)$. A new mothod for construction of systems LBDs will be presented in the lecture. This method allows to construct infinite series of LBDs with new parameters.

Department of Computer Sciences, Netanya Academic College, University St. 1, 42365, Netanya, Israel
    E-mail address: muzy@netanya.ac.il