1050-05-80   **Etsuko Bannai*** (`etsuko@math.kyushu-u.ac.jp`), 2-8-21 Misakigaoka, Maebaru-shi, Fukuoka 819-1136, Japan. *Euclidean designs and coherent configurations.*

Euclidean designs are introduced by Neumaier-Seidel (1988) as a generalization of spherical designs. As is well known by Delsarte-Goethals-Seidel (1977), association schemes play important roles in the study of spherical designs. Through the study of Euclidean designs, we found out that even if it is not tight, a Euclidean design satisfying some good conditions has a structure of the coherent configuration. Coherent configuration is a purely combinatorial concept defined by D. G. Higman. It is obtained by abstracting the properties of general, not necessarily transitive, permutation groups in the same way as association scheme was obtained by abstracting the properties of transitive permutation groups. As an application of this general theory, we discuss the current status of our research to try to classify Euclidean 4-designs (X,w) on two concentric spheres $S = S_1 \cup S_2$ whose weight function is constant on each $X \cap S_i (i = 1, 2)$ and $X \cap S_i (i = 1, 2)$ is at most 2-distance set. We will also give a series of feasible parameters for coherent configurations, if they exist then we will have Euclidean tight 4-designs on two concentric spheres. This talk is base on a joint work with Eiichi Bannai. (Received February 26, 2009)