1003-05-816 **Hirai Hiroshi\*** (`hirai@kurims.kyoto-u.ac.jp`), Kyoto 606-8502, Japan. *Geometry behind the split decomposition of finite metrics.*

Bandelt-Dress' split decomposition theory of finite metrics provides a promising tool for phylogenetic tree/network reconstruction from given distance matrices. The split decomposition is an additive decomposition of metrics, where a metric is canonically decomposed into a sum of split metrics and a split-prime metric. In this talk, we discuss the split decomposition in terms of convex analysis and polyhedral geometry. In this approach,
1. the split decomposition can be derived as a special case of a more general decomposition of polyhedral/discrete concave functions.
2. combinatorics of splits concerning the split decomposition can be understood as geometric properties of a hyperplane arrangement and a point configuration.
3. the split decomposition can be naturally extended for distance functions, which may violate triangle inequality, using partial split distances. (Received October 01, 2004)