東北大学大学院情報科学研究科
純粋・応用数学研究センター

情報数理談話会のお知らせ

日　時：　2018 年 6 月 21 日 (木) 16:00 より 17:00 まで
(会場にお茶を用意しております)
場　所：　東北大学大学院情報科学研究科棟 2 階大講義室

講演者：　Mohammad Samy Baladram 氏 (東北大学大学院情報科学研究科)
題　目：　Explicit constructions of spherical designs from ball designs and simplex designs

備　考：　この情報数理談話会は課程博士予備審査会を兼ねています

[概 要] A spherical t-design is a finite set of points on the n-dimensional unit sphere S^n such that the average value of any polynomial f of degree at most t on the set equals the average value of f on the whole sphere. Rabau and Bajnok showed that it is possible to construct a spherical design on S^n using a design on an interval $[-1, 1]$, that is, an interval t-design, and a spherical t-design on S^{n-1}. Motivated by this result, we introduce a generalization of interval t-designs to higher dimensions as ball t-designs on B^d. By using this and some spherical designs on S^n, we construct spherical designs on S^{n+d} for $d \geq 2$. By this method, we explicitly construct spherical 5-designs on S^n for every n. Moreover, Rabau and Bajnok's construction can be seen as a composition of spherical t-designs on 1- and n-dimensional spheres with the help of some interval t-designs. We propose a construction method for spherical t-designs on S^n by using some designs with the same strength on lower dimensional spheres whose sum of the dimensions is $n+1$. To do this, we will introduce another generalization of interval t-designs on $(0, 1]$ to higher dimensions as t-designs on a simplex. By this method, we explicitly construct spherical designs on S^3 for an arbitrary strength.

ホームページ：http://www.math.is.tohoku.ac.jp/research/colloquium.html