A new construction of spherical designs by using Hopf maps

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Abstract

It is known that one can make spherical t-designs on a $d$-sphere $S^d$ from a spherical $t$-design on $S^{d-1}$ and an interval $t$-design on the open interval $(-1, 1)$ with respect to the weight function $w_d(s) := (1 - s^2)^{(d-2)/2}$ ([Rabau–Bajnok, J. Approx. Theory (1991)], [Wagner, Monatsh. Math. (1991)]).

In this talk, we generalize the fact above and applying it for Hopf maps, then we have an algorithm to making spherical designs on $S^3$ [resp. $S^7$] from spherical designs on $S^2$ and $S^1$ [resp. $S^4$ and $S^3$].