

Read me

1. The folders are named after the dimension of rotational quasi-symmetric points (R-QSP) restored in it.
2. In each folder, the coordinates of rotational quasi-symmetric points of the i -th ($1 \leq i \leq d$) axis are restored in the file “P_ d_i .txt”, where d is the dimension of the rotational quasi-symmetric points (identical to the name of the folder). Assigned probabilities (or weights) are restored in the file “AProb_ d .txt”, correspondingly. All the data in the files are arranged in the same sequential order from the first point to the final point. The cardinal number of the point sets in each dimension is listed in Table 1, which are also indicted as the first number in the file “AProb_ d .txt”.
3. The generalized F-discrepancy (GF-discrepancy) is chosen as the objective function to be minimized. The genetic algorithm (GA) is used to choose the rotation angles. Table 1 shows the number of points and the GF-discrepancy for each dimension given in the files.
4. For details of Quasi-symmetric points (QSP), rotational quasi-symmetric points (R-QSP) and the concept of generalized F-discrepancy (GF-discrepancy), refer to the references.

Table 1

Dimension	Number of points	Generalized F-discrepancy	
		Before rotation	After rotation
3	14	0.3200	0.1412
4	24	0.3333	0.0958
5	42	0.3265	0.0874
6	44	0.3125	0.0673
7	78	0.2963	0.0736
8	144	0.2800	0.0645
9	146	0.2645	0.0558
10	276	0.2500	0.0527
11	278	0.2367	0.0520
12	280	0.2245	0.0444
13	282	0.2133	0.0405
14	284	0.2031	0.0423
15	286	0.1938	0.0358
16	288	0.1864	0.0406
17	546	0.1925	0.0442
18	548	0.1982	0.0407
19	550	0.2035	0.0362
20	552	0.2085	0.0384

21	1066	0.2132	0.0341
22	1068	0.2175	0.0337
23	1070	0.2216	0.0329
24	1072	0.2254	0.0361

References:

- [1] J. B. Chen, S. H. Zhang. Improving point selection in cubature by a new discrepancy. *SIAM Journal on Scientific Computing*, (2013), in press.
- [2] J. Xu, J. B. Chen, and J. Li. Probability density evolution analysis of engineering structures via cubature points. *Comput. Mech*, 50 (2012), pp. 135-156.
- [3] V. Victoir. Asymmetric cubature formulae with few points in high dimension for symmetric measures. *SIAM J. Numer. Anal.*, 42 (2004), pp. 209-227.

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