

Data for “Variations on five-dimensional sphere packings”

Title: Data for “Variations on five-dimensional sphere packings”

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URI: <https://hdl.handle.net/1721.1/157699>

List of files, types, and sizes:

| File name | Type | Size |
|------------------------------|------------|-------|
| <code>D5.txt</code> | plain text | 1 KB |
| <code>L5.txt</code> | plain text | 1 KB |
| <code>Q5.txt</code> | plain text | 1 KB |
| <code>R5.txt</code> | plain text | 1 KB |
| <code>K9-1.txt</code> | plain text | 9 KB |
| <code>K9-2.txt</code> | plain text | 9 KB |
| <code>verify.jl</code> | plain text | 12 KB |
| <code>symmetries.sage</code> | plain text | 1 KB |

Notes:

This data set includes all the code and data from the paper “Variations on five-dimensional sphere packings” by Cohn and Rajagopal (available at <https://arXiv.org/abs/2412.00937>). The first six files listed above contain coordinates for the D_5 , L_5 , Q_5 , and R_5 kissing configurations and the two nine-dimensional configurations; each line corresponds to one point, with coordinates separated by commas. The file `verify.jl` contains Julia code that checks the dot products and multiplicities, computes the number of symmetries except in nine dimensions, verifies each assertion needed for the proof of Theorem 4.3, and verifies that Table 4.2 works and the symmetry groups of the uniform packings are as described in Section 4.3. The file `symmetries.sage` contains SageMath code that computes the number of symmetries for the nine-dimensional kissing configurations.