TESTING CLEBSCH-GORDAN COEFFICIENTS

Wigner Matrix.

(1) Using the `lie_learn` library: in `https://github.com/AMLab-Amsterdam/lie_learn/`, under

```
lie_learn - representations - SO3 - wigner_d.py
```

(2) Using the table in `https://link.springer.com/content/pdf/bbm%3A978-1-4684-0208-7%2F1.pdf` (for rank 1 and 2 only)

Equations to test.

(1)

$$\sum_{m'_1,m'_2} C^{(l_0,m_0)}_{(l_1,m'_1)(l_2,m'_2)} D^{(l_1)}_{m'_1,m_1}(g) D^{(l_2)}_{m'_2,m_2}(g) = \sum_{m'_0} D^{(l)}_{m_0,m'_0}(g) C^{(l_0,m'_0)}_{(l_1,m_1)(l_2,m_2)}$$

(`https://arxiv.org/pdf/1802.08219.pdf`)

(2) Equation (A.7)

$$D^{l_1}_{m'_1,m_1}(\Omega) D^{l_2}_{m'_2,m_2}(\Omega) = \sum_{l,m,m'} C(l_1,l_2,l;m'_1,m'_2,m') C(l_1,l_2,l;m_1,m_2,m) D^{l}_{m',m}(\Omega)$$

(`https://link.springer.com/content/pdf/bbm%3A978-1-4684-0208-7%2F1.pdf`)

(3)

$$D^l_{mn} = \sum_{m_1+m_2=n, n_1+n_2=n} D^{l_1}_{m_1 n_1} D^{l_2}_{m_2 n_2} C(l_1,l_2,l;m_1,m_2,m) C(l_1,l_2,l;n_1,n_2,n)$$

(page 24 of `http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.152.9702&rep=rep1&type=pdf`)

Current goal. : Verify the three equations using the two way of computing wigner matrices.

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