**Visualizing 2PN Binary Black Hole Spin Precession**

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In the post-Newtonian regime, the time it takes the two black-holes to orbit each other is much shorter than the time it takes the spins and the orbital angular momentum to precess about the direction of the total angular momentum which, in turn, is much shorter than the time it takes the binary's orbit to shrink due to gravitational-wave emission. In short, the dynamics of precessing binary black holes has the following timescale hierarchy: . This inequality has been exploited in [1], where it was shown that relative orientations of the three angular momenta are fully specified by the magnitude of the total spin, which oscillates on the precession time [1]. Given the variables identified in [1] that respect the timescale separation of the dynamics of precessing binary black holes (, J, S), we build a 3D visualization routine in Python to explore the phenomenology of spin precession.

References

[1] D. Gerosa, M. Kesden, U. Sperhake, E. Berti, and R. OShaughnessy, PRD 92, 064016 (2015), arXiv:1506.03492 [gr-qc].