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## Gyroscopic Precession in the Vicinity of a Black Hole's Event Horizon and Naked Singularity for Static and Stationary Spacetime

In this work, we employ the Frenet-Serret formalism of gyroscopic precession to compute the precession frequency close to the event horizon and naked singularity (NS) for spherically symmetric and axisymmetric spacetime. We aim to determine the possibility of using the gyroscopic precession to distinguish a black hole event horizon from a naked singularity. We show that it is possible to have a timelike trajectory crossing the black hole along which the precession frequency remains finite at the horizon. We demonstrate these using spherically symmetric static solutions as well as axisymmetric stationary Kerr solutions. We will also discuss how the gyroscopic precession frequency helps us to distinguish a black hole's event horizon from a naked singularity for these above kinds of spacetime by using both spinning extended and non-spinning point mass test gyroscopes.

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