

Abstract Submitted
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Is the central object in the galaxy a black hole?¹ LALEH SADEGHIAN, CLIFFORD WILL, Washington University, St. Louis — The spin and quadrupole moment of the supermassive black hole at the Galactic center can in principle be measured by studying the precessions of the orbital planes of stars in high-eccentricity orbits within milliparsec distance of the black hole [1]. Measuring these precessions could yield a test of the black hole no-hair theorem, and thus verify if the central object in the Galaxy is really a black hole. Other factors that might perturb these orbits include a population of other stars orbiting the black hole, a distribution of dark matter near the black hole and tidal distortions of the stars as they pass near the black hole at perihelion. We calculate the effects of these perturbing factors analytically by using standard orbital perturbation theory, and compare them with the relativistic precessions.

[1] C. M. Will, *Astrophys. J. Lett.* 674, L25 (2008)

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