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Constraining off-Kerr deviations using intermediate mass ratio inspirals in Advanced LIGO¹ DUNCAN BROWN, LIGO Laboratory and Theoretical Astrophysics, California Institute of Technology, HUA FANG, Theoretical Astrophysics, California Institute of Technology — The inspiral of a stellar mass compact object into an intermediate mass black hole is a promising source for the detection of gravitational waves in Advanced LIGO. The gravitational waves from such intermediate mass ratio inspirals (IMRIs) will act as a probe of the spacetime structure of the massive central body. If the IMRI central body is a Kerr black hole, then the multipolar structure of its spacetime is determined only by its mass and spin. We discuss the prospects with which Advanced LIGO can measure deviations of the central body's spacetime from that of Kerr. We find the central body's quadrupole moment and tidal coupling can be measured with modest but interesting accuracy.

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