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Tidal heating as probe of black hole horizon

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With the observation of the multiple binary inspirals, we begin to question whether the components of the binary are black holes or some exotic compact objects (ECOs). The “black holeness” or the deviation from it can be tested in several ways. The distinguishing feature of a black hole from ECOs in the presence of the horizon. This surface acts as a one-way membrane that absorbs energy. Due to this different behavior from ECOs, in the last stages of an inspiral black hole exchange energy. These backreact on the orbit, transferring energy and angular momentum from their spin into the orbit. This effect is called tidal heating. I will discuss how tidal heating can be used to test “black hole ness”; and distinguish black holes from other compact objects. I will also discuss how the black hole tidal heating affects waveform modeling.

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