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Fast Radio Bursts and Radio Transients from Black Hole Batteries CHIARA MINGARELLI, Caltech, JANNA LEVIN, Columbia University, JOSEPH LAZIO, NASA Jet Propulsion Laboratory — Most black holes (BHs) will absorb a neutron star (NS) companion fully intact, without tidal disruption, suggesting the pair will remain dark to telescopes. Even without tidal disruption, electromagnetic (EM) luminosity is generated from the battery phase of the binary when the BH interacts with the NS magnetic field. Originally the luminosity was expected in high-energy X-rays or gamma-rays, however we conjecture that some of the battery power is emitted in the radio bandwidth. While the luminosity and timescale are suggestive of fast radio bursts (FRBs), NS–BH coalescence rates are too low to make these a primary FRB source. Instead, we propose the transients form a FRB sub-population, distinguishable by a double peak. The main burst is from the peak luminosity before merger, while the post-merger burst follows from the NS magnetic field migration to the BH, causing a shock. NS–BH pairs are desirable for ground-based gravitational wave (GW) observatories since the pair might not be detected any other way, with EM counterparts augmenting the scientific leverage beyond the GW signal. Valuably, EM signal can break degeneracies in the parameters encoded in the GW as well as probe the NS magnetic field strength, yielding insights into open problems in NS magnetic field decay.

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