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Compact Binaries and Supermassive Black Holes SHANE LARSON, Northwestern University, ERIC ADDISON, Utah State University, PABLO LAGUNA, Georgia Tech — Given the stellar density near the galactic center, close encounters between compact object (CO) binaries and the supermassive black hole (SMBH) are plausible. Tidal disruptions resulting from such encounters have been proposed as possible sources of extreme-mass-ratio inspirals (EMRIs) and hyper velocity stars (HVS) in the galaxy, however the surviving binaries merit attention as they will suffer perturbations to their orbital parameters. We show the conditions under which CO binaries are able to survive the tidal field of supermassive black holes during a parabolic encounter, as well as the distribution of orbital parameters post-encounter. The effect of the tidal field on binaries that remain unbound from the SMBH is to de-circularize and shrink them, thus accelerating merger due gravitational radiation emission and affecting the predicted compact binary coalescence (CBC) rates. For disrupted binaries we show that the component of the compact object binary becoming bound to the supermassive black hole have initial eccentricities $\approx 1 - \mathcal{O}(10^{-2})$ but circularize dramatically by the time they enter the LISA band, consistent with previous studies.

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