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Bursty Gravitational Waves NICHOLAS LOUTREL, Montana State University, FRANS PRETORIUS, Princeton University, NICO YUNES, Montana State University — Compact objects in highly elliptical binaries, unlike their circular counterparts, emit most of their gravitational radiation during pericenter passage. Such events would look like a sequence of bursts in time-frequency space, which would be difficult to extract with a matched filtering approach. However, if we could predict the time and frequency of the next burst, we could then search over that region of time-frequency space until the next burst is detected and then stack the power of the bursts to create an enhanced data product. We here present a proof of concept burst model, where we treat the bursts as boxes in time-frequency space and model the evolution of the system to Newtonian order. From this, we develop an algorithm to determine the mapping between boxes. We study the accuracy of the model by comparing the burst model to numerical solutions of the system under Newtonian order radiation reaction and by studying the strength of the 1PN corrections to the energy and angular momentum flux. Finally, we explain how this model can be used to test General Relativity and alternative theories of gravity.

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