Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Gravitational waves from eccentric binary systems VALENTIN NECULA, SERGEY KLIMENKO, GUENAKH MITSELMAKHER, University of Florida, JANNA LEVIN, Columbia University — Searches for compact binaries in general assume the standard formation mechanism, however such systems may also appear through dynamical interactions in the presence of supermassive black holes presumed to exist at the center of galaxies. These binaries are expected to have high initial eccentricities and the emitted gravitational radiation may enter the frequency range of ground-based detectors soon after they are formed, in contrast to standard compact binaries which circularize long before the merger time. A significant fraction of these binary systems may maintain high eccentricities throughout their lifetime, providing unique gravitational wave signatures which are not captured efficiently by searches designed for circular systems. We discuss this promising source of gravitational wave radiation and outline detection strategies with the initial and advanced ground-based detectors.

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Date submitted: 09 Jan 2012 Electronic form version 1.4