

The Eccentric Behavior of Inspiring Compact Binaries

Nicholas Loutrel

Department of Physics, Princeton University, Princeton, NJ, 08544, USA

E-mail: nloutrel@princeton.edu

Samuel Liebersbach

eXtreme Gravity Institute, Department of Physics, Montana State University, Bozeman, MT 59717, USA.

E-mail: samuel.liebersbach@gmail.com

Nicolás Yunes

eXtreme Gravity Institute, Department of Physics, Montana State University, Bozeman, MT 59717, USA.

E-mail: nicolas.yunes@montana.edu

Neil Cornish

eXtreme Gravity Institute, Department of Physics, Montana State University, Bozeman, MT 59717, USA.

E-mail: ncornish@montana.edu

Abstract. The gravitational wave emission of a binary system is generally thought to cause the Keplerian orbital eccentricity to decay throughout the inspiral phase of the coalescence. In stark contrast to this well known result, we recently discovered that, when considering effects beyond this secular behavior, the radiation reaction force can induce a secular growth of the Keplerian eccentricity in the late inspiral. We here discuss the growth's interpretation in terms of coordinate quantities, and its impact on gravitational wave observations.