

Abstract Submitted  
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**Binary Black Hole Mergers in a Gas Cloud and their Electromagnetic Signatures** TANJA BODE, ROLAND HAAS, Georgia Institute of Technology, TAMARA BOGDANOVIC, University of Maryland, PABLO LAGUNA, DEIRDRE SHOEMAKER, Georgia Institute of Technology — Coincident detections of electromagnetic (EM) and gravitational wave (GW) signatures from individual supermassive black hole (SMBH) binary mergers are the next observational grand challenge. Such coincident detections would identify the location of the event to higher accuracy as well as provide a means to study cosmological evolution, accretion processes associated with SMBH binaries, and more generally to tests of underlying principles of general relativity. Understanding conditions under which coinciding EM and GW signatures are expected to arise during coalescence is therefore of paramount importance. As an essential step towards this goal, we present results from the first fully general relativistic, hydrodynamical study of the late inspiral and merger of equal-mass SMBHs with spin  $a/M_h \leq 0.6$  in a gas cloud.

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