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Numerical Simulations of Wet Black Hole Binaries and their Electromagnetic Signatures

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The detection of electromagnetic signatures from the coalescence of supermassive black hole binaries will have a tremendous impact for our understanding of the growth and evolution of these massive compact objects. Given current uncertainties, a great challenge in this endevour is to uniquely define the gaseous environment surrounding these binaries, in particular during their last inspiral and merger. What is almost certain is that the properties of the gas in the vicinity of the holes are likely to be bracketed between two scenarios: a hot and turbulent gas cloud and a rotationally supported circumbinary disk. I will present results from the first fully general relativistic, hydrodynamical study of the late inspiral and merger of binaries with equal mass and spinning supermassive black holes immersed in a gas cloud. In particular, I will show the potential electromagnetic signatures arising from these merger events.