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Dynamical scalarization and descalarization in binary black hole mergers HELVI WITEK, University of Illinois at Urbana-Champaign, HECTOR O. SILVA, AEI Potsdam, Germany, MATTHEW ELLEY, King's College London, UK, NICOLAS YUNES, University of Illinois at Urbana-Champaign — Scalar fields coupled to the Gauss-Bonnet invariant can undergo a tachyonic instability, leading to spontaneous scalarization of black holes. Studies of this effect have so far been restricted to single black hole spacetimes. We present the first results on dynamical scalarization in head-on collisions and quasi-circular inspirals of black hole binaries with numerical relativity simulations. We show that black hole binaries can either form a scalarized remnant or dynamically descalarize by shedding off its initial scalar hair. The observational implications of these finding are discussed.

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