Self-force for a particle in circular orbit around Schwarzschild black hole. ABHAY SHAH, JOHN FRIEDMAN, LARRY PRICE, University of Wisconsin, Milwaukee, TOBIAS KEIDL, University of Wisconsin, DONG-HOON KIM — This talk reports the successful computation of the self-force in the radiation gauge for a particle orbiting a Schwarzschild black hole. We find the renormalized spin-2 Weyl scalar for a particle in circular orbit in Schwarzschild geometry, subtracting from the retarded field an expression for the singular field to subleading order. Remarkably, only one term in a lengthy expression for the singular field contributes at this order, and that term coincides up to an overall factor (associated with a boost) with the perturbed Weyl scalar of a static field. We use a numerical matching procedure to remove the singular field to one additional order. Finally, following the procedure outlined in KFW (Phys Rev D, 75, 2007) we calculate the renormalized Hertz potential (from the renormalized Weyl scalar), from which one finds the renormalized perturbed metric and hence the conservative part of the self-force.

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