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Self-Force on Accelerated Charges in Generic Spacetimes THOMAS LINZ, JOHN FRIEDMAN, ALAN WISEMAN, University of Wisconsin Milwaukee — Following the work of Barack and Ori we develop the mode-sum renormalization formalism for an accelerated charge (scalar charge, electric charge, or a mass) moving in arbitrary space time. We obtain expressions for renormalization parameters (RPs) of the mode-sum expansion in a Lorenz gauge. In particular, we show that, for a charge moving along a generic trajectory, the singular field can be described entirely by the leading and sub-leading terms (the 'A' and 'B' terms): the remaining contributions to its mode-sum expansion vanish at the particle. We then obtain explicit expressions for the A and B parameters. As a check, we use these RPs to recover Wiseman's result that the self-force vanishes on a static scalar charge outside a Schwarzschild black hole.

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