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Static Electromagnetic and Gravitational Perturbations of Schwarzschild Spacetime TOBIAS KEIDL, JOHN FRIEDMAN, SWAPNIL TRIPATHI, ALAN WISEMAN, University of Wisconsin–Milwaukee — This talk describes an explicit computation of the perturbed gravitational field of a static point mass and of the electromagnetic field of a point charge in Schwarzschild background. Starting from the Teukolsky equation ¹, we calculate the gauge invariant Weyl Tensor components. By using free radial functions implicit in the Cohen-Kegeles prescription ², and by adding a mass perturbation outside of the Cohen-Kegeles gauge one can construct a gauge in which the metric is regular. The result is subtle, involving the piecing together of gauges regular above and below the position of the particle. The method is likely to be valid for particles in a Kerr geometry.

¹Teukolsky, S. A., *Astrophys. J.*, **185**, 635-647, (1973)

²Kegeles, L. S. and Cohen, J. M., *Phys. Rev. D* **19**, 1641-1664, (1979)

Tobias Keidl
University of Wisconsin–Milwaukee

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