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Weak Gravitational Lensing Poisson Equation THOMAS KLING, Bridgewater State College — To date, the observed gravitational shear has been related to the inferred projected mass density of the lens by an integral equation. Alternately, one can relate the observed shear to the gravitational potential by a partial differential equation. Using the Bianchi identity in the Newman Penrose spin coefficient formalism, we derive a new Poisson equation for the mass density where the source term is derivatives of the weak lensing shear. We examine the feasibility of integrating this Poisson equation for wide field ground based and space based telescopes.

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