



Aaron Luttmann (aluttman@clarkson.edu) Clarkson University, Potsdam, NY 13699, USA, *Using Function Spaces to Produce Different Solutions to an Astronomical Imaging Problem.*

ABSTRACT. Images captured from ground-based telescopes all suffer from two primary problems. Firstly, as with all digital imagery, the measurements are noisy. Secondly, images taken from the ground are blurry due to atmospheric interference. Atmospheric blur can be modeled and “undone” by an integral equation that is ill-posed. A form of Tikhonov regularization must be used to make the problem well-posed, and different solutions are computed depending on what function space the solution is assumed to live in. We will show the problem formulation changes depending on what space it is solved in, e.g. L^1, L^2 , or the space of functions of bounded variation, and how the different function spaces naturally correspond to different assumptions on the object being imaged.