Stray Light Correction as a Deblurring Problem[1] JOHN HORN-STEIN, Naval Research Laboratory — The problem of correcting for stray light is shown to be a type of deblurring problem. When the optical system is linear, correcting for stray light reduces to a generalization of a deconvolution problem. As such, it is an ill-posed inverse problem, in which the goal is to estimate the true radiances incident on the instrument's entrance aperture from the signals registered by its detectors. Optical ghosts and out of field and out of band stray light are all included in this formulation. They are due to the non-ideal character of the optical impulse response function, which, in turn, is proportional to the system's point spread function. Backgrounds due to thermal emission within the optical system or from the radioactivity of its components are not included, since they are independent of the true scene. Several standard techniques of solving ill-posed inverse problems are being tested for correcting for stray light in spectral imagers. Results obtained via Backus-Gilbert estimation are reported here.

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