

1 Introduction

Modern astronomy relies on Charged Coupled Devices (CCDs) and other such imaging sensors for recording astronomical data. All of these technologies rely on photons exciting the electrons in some semiconducting material. Counting those electrons becomes a proxy for the number of photons detected. Because of this, recording astronomical data is a counting problem, and thus we can expect the number of photons recorded on a CCD to be distributed as a Poisson distribution. As with all electronic measurements, we must also be aware of sources of noise. Since the noise appears in our counts, we can also expect it to be distributed as a Poisson distribution. We will consider an idealized system of a single pixel and investigate whether we can distinguish between a noise source with rate parameter λ_{noise} and some astronomical source with rate parameter λ_{star} .