CCDs and their limitations due to noise
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Abstract
Since their invention in the 70's CCD imagers have been used extensively in numerous scientific areas including astronomy, medicine and microscopy. CCDs utilize the photoelectric to convert incident photons into electric charge across an array of sensors. The limitations of a CCD are set by their geometry and the noise caused by the collection apparatus and the environment in which it is used. In this report, I will present a detailed summary of the function of a CCD as well as the most significant noise sources.

Outline
- Description of CCD
  - Architecture
    - limitations due to architecture
  - Charge Generation
  - Charge Collection
  - Charge Transfer
  - Charge Measurement
- Common Noise Sources
  - Johnson Noise
  - White Noise
  - Shot Noise
  - Dark Current