Science Validation of LSST Alert Processing

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## ABSTRACT

A description of the Prompt Processing Performance with respect to ComCam and LSSTCam observations including sustained observing periods and science validation surveys. This should include the completeness of alert generation, the fraction of false positives, the performance of machine learning for false positive classification, the photometric accuracy of the time series data, how the performace degrades as a function of system parameters and observing conditions (focal plane position, airmass, seeing, transparency, source color). Examples of alerts detected in the commissioning period.

## 1. INTRODUCTION

## 2. THE LSST ALERT PRODUCTION SYSTEM

## 3. COMMISSIONING FIELDS AND SCIENCE VALIDATION SURVEYS

## 4. DIFFERENCE IMAGE PIPELINE PERFORMANCE

### 4.1. *Data Processing and Analysis*

### 4.2. *Astrometric and Photometric Calibration*

### 4.3. *Template generation*

### 4.4. *Source detection and completeness*

## 5. SOURCE CHARACTERIZATION AND ALERT GENERATION

### 5.1. *Source classification and false positives*

### 5.2. *Deep-learning training and classification performance*

### 5.3. *Alert distribution and packages*

## 6. ALERT PERFORMANCE AND COMPARISON TO EXTANT DATA SETS

## APPENDIX

**Initial paper list added here for reference.**

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# A. REFERENCES

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## B. ACRONYMS

| Acronym | Description |
|---------|-------------|
| DAQ | Data Acquisition System |
| DM | Data Management |
| EPO | Education and Public Outreach |
| LSST | Large Synoptic Survey Telescope |