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THE PAN-STARRS2 SYSTEM AND THE PS1 REFERECENCE CATALOG: IMPLICATIONS FOR NEO DISCOVERY AND CHARACTERIZATION

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ABSTRACT

The Pan-STARRS2 Telescope is scheduled to start commisioning observations in April 2017. Pan-STARRS2 has the same optics design as the Pan-STARRS1 telescope, however the PS2 optics fabrication is superior to that of PS1, and the telescope is a completely different design with a different enclosure and different characteristics. The Gigapixel Camera 2 for PS2 has improved devices and controller electronics with reduced persistance, improved charge transfer efficiency, reduced read time, and better cosmetics. The delivered PSF is more uniform across the focal plane as measured with the quartersize test camera. The results from commissing including the measured charateristics of the PS2 telescope and camera will be presented and compared with the known performance of the PS1 telescope and camera. The impact of this performance and the combination of PS1 and PS2 working in tandem for the total Pan-STARRS capability for NEO discovery will be discussed.

The impact and special relevance for NEO discovery and characterization of the

calibrated Pan-STARRS1 Survey will also be presented. The Pan-STARRS1 Survey included the 3pi Steradian Survey in 5 bands (grizy) as well as the Ecliptic plane survey in w band. We will discuss how the resulting new level of photometry and extended Gaia astrometry will aid NEO discovery characterization efforts. The mean 5 sigma point source limiting sensitivities in the stacked 3pi Steradian Survey in (grizy) are (23.3, 23.2, 23.1, 22.3, 21.4) respectively. The upper bound on the systematic uncertainty in the photometric calibration across the sky is 7-12 millimag depending on brightness and bandpass. This is crucial for NEO characterization. The systematic uncertainty of the astrometric calibration using the Gaia frame comes from a comparison of the results with Gaia: the standard deviation of the mean and median residuals (_ra; _dec) are (2.3, 1.7) milliarcsec, and (3.1, 4.8) milliarcsec respectively. The resulting catalog will improve NEO astrometry, particularly for smaller field of view follow-up programs.