

# Assessing the detectability of exoplanets in the Magellanic Clouds

## ABSTRACT

Hundreds of extra-Solar planets have been discovered in the Milky Way, but an extra-Galactic exoplanet has never been discovered yet. The properties of exoplanets outside our own galaxy may provide important clues for star and planet formation. A key question in the field of exoplanets today is how whether different stellar populations host different planet populations. Although some exoplanet surveys have targeted planet populations outside the Solar neighborhood (for example the galactic bulge and the globular cluster 47 Tuc), no survey has successfully detected extrasolar planets in a stellar population as dramatically different from the thin disk as those Magellanic clouds. We propose to target the Magellanic clouds, both large and small to both 1) detect the first extragalactic exoplanet and 2) observe differences in the population of hot Jupiters in the Clouds, contrasted with the hot Jupiter population of the Milky Way. We propose to observe the Large and Small Magellanic clouds with high cadence over a series of nights in g-band with the Dark Energy Camera. We have conducted a series of simulations that demonstrate that hot Jupiters are detectable in the Clouds. The first detection of an extragalactic planet would be a significant milestone for the field of exoplanets and a first step toward population analysis of these objects. This discovery would lead to new insights into the efficacy of planet formation outside the Milky Way.

## 1. Method

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