

Abstract Submitted  
for the APR16 Meeting of  
The American Physical Society

**Measuring the Dark Energy Driven Expansion of the Universe at Redshift  $\sim 1$**  ANDREA KUETER-YOUNG, JOHN MOUSTAKAS, Siena College — In 1998 astronomers made the remarkable discovery that the universe is expanding at an ever-faster rate due to an unknown force or energy field now known as "dark energy." The Dark Energy Spectroscopic Instrument (DESI) survey will measure the accelerating expansion of the universe with unprecedented precision, yielding crucial insights into the physical nature of dark energy. In order to effectively carry out this measurement, however, DESI needs to efficiently select five distinct classes of distant objects from ground-based imaging surveys containing millions of unimportant, interloping extragalactic sources. Focusing on one specific class of objects—star-forming emission-line galaxies—we investigate a variety of Machine Learning algorithms in order to determine which method optimally selects emission-line galaxies. We apply these algorithms to spectroscopic test datasets from the Sloan Digital Sky Survey and the DEEP2 galaxy redshift survey, and use cross-validation to test the effectiveness of each method. We find that the Machine Learning algorithms considered yield a negligible improvement over the traditional, simple method of using color-color cuts to select emission-line galaxies.

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Date submitted: 05 Jan 2016

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