Novel Aspects of the DESI Data Acquisition System
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DARK ENERGY SPECTROSCOPIC INSTRUMENT COLLABORATION —
The Dark Energy Spectroscopic Instrument (DESI) will measure the effect of dark
energy on the expansion of the universe. It will obtain optical spectra for tens of
millions of galaxies and quasars, constructing a 3-dimensional map spanning the
nearby universe to 10 billion light years. The survey will be conducted on the May-
all 4-meter telescope at Kitt Peak National Observatory starting in 2018. In order
to achieve these scientific goals the DESI collaboration is building a high throughput
spectrograph capable of observing thousands of spectra simultaneously. In this pre-
sentation we discuss the DESI instrument control and data acquisition system that
is currently being developed to operate the 5,000 fiber positioners in the focal plane,
the 10 spectrographs each with three CDD cameras and every other aspect of the
instrument. Special emphasis will be given to novel aspects of the design including
the use of inexpensive Linux-based microcontrollers such as the Raspberry PI to
control a number of DESI hardware components.