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Galaxy Properties and Substructure in the Cluster Abell 160 CRAIG KOONTZ, JASON PINKNEY, Ohio Northern University — We continue development of a procedure for building a large catalog of cluster galaxies and their photometric properties, as measured with CCDs. Our first case, Abell 160, is relatively nearby and we have already obtained spectroscopic redshifts for its brightest galaxies. We have mosaiced this cluster in R and V filters using a CCD imager on the 1.3-meter McGraw-Hill telescope. For each CCD frame we fit a WCS (world coordinate system), remove bright cosmic rays, and extract sources using "SExtractor." We create software for merging source catalogs in such a way as to reject residual cosmic rays and other invalid sources, and to combine redundant measurements without double counting. The measured properties include magnitude, ellipticity, position angle, size, and color (V-R). We compare our data to those of the HST (Hubble Space Telescope) and SDSS (Sloan Digital Sky Survey) archives to examine the accuracy of our star/galaxy separation and our color measurements. For our substructure investigation, we draw several subsamples of galaxies based on stellarity index, color (the color-magnitude relation), magnitude and velocity. The smallest subsample of spectroscopically confirmed members produces significant substructure signals from 1D (velocity) and 3D (x,y,velocity) diagnostics - a small, offset group may be the culprit. The 2D (x,y) diagnostics applied to the larger samples produce some significant statistics, the cause does not seem to be a large-scale merger, but perhaps several small groups. This is consistent with previous X-ray data showing X-ray emitting gas clumped around small groupings of galaxies.

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