Broadband Photometry of the Potentially Hazardous 2002 AM31: A Binary Near-Earth Asteroid

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TMO-NEO-PHOT

TMF-12

TMO 0.6m Telescope
Time-resolved BVRI Photometry

• Bessel BVRI Passbands

• Charge-Coupled Device (CCD)

• Image Processing
Potentially Hazardous Asteroid 2002 AM31: A Binary Near-Earth Asteroid

- Discovered by the LINEAR NEO Survey in New Mexico on January 14, 2002
- Potentially Hazardous Asteroid (PHA) by the IAU Minor Planet Center
- The object passed within 0.035 AU of the Earth on July 22, 2012
Broadband Spectral Analysis of 2002 AM31

B-R= 0.217+/-0.018 mag
V-R=0.066+/-0.010 mag
R-I=0.001+/-0.110 mag

<table>
<thead>
<tr>
<th>MISFIT</th>
<th>OBJECT</th>
<th>NAME</th>
<th>TAXONOMIC (THOLEN)</th>
<th>CLASS (BUS)</th>
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<tr>
<td>1.173</td>
<td>907</td>
<td>Rhoda</td>
<td>C</td>
<td>Xk</td>
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<tr>
<td>1.186</td>
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<td>S</td>
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<td>Papagena</td>
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<td>1.769</td>
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<td>Edisona</td>
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Broadband colors compared to the colors of cataloged asteroids in the SMASS II database suggest S-group Spectral Classification.
The slope parameter $G=0.61$ is indicative of a high optical albedo and E-type spectral classification.
Light Curve of 2002 AM31

Note the dispersion of the phased light curve
Binary Systems

• Binary asteroids are 2 objects orbiting their common center of mass
• Binary asteroids show two (or three) light curve components that are linearly additive

Demonstration of mutual eclipse events in Binary Systems. The secondary object is revolving clockwise as viewed from above.
The short period indicates the rotation period of the primary object. The long period component shows mutual events and the secondary light curve.
Works Cited

Astro Mechanics 0.6m, f/16 or 36 (coude focus) Ritchey-Chretien reflector on a German off-axis equatorial mount. Installed in 1966, Table Mountain Observatory Optical Astronomy, Web. 05 Aug 2012, http://tmoa.jpl.nasa.gov/telescopes.htm


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