

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

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JPL Table Mountain Observatory Near-Earth Object Photometry Project

TMO-NEO-PHOT



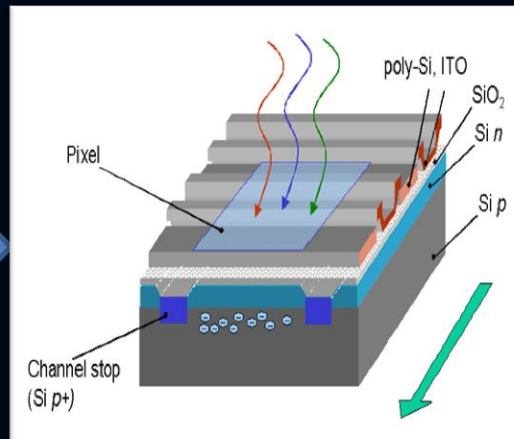
TMF-12



TMO 0.6m Telescope

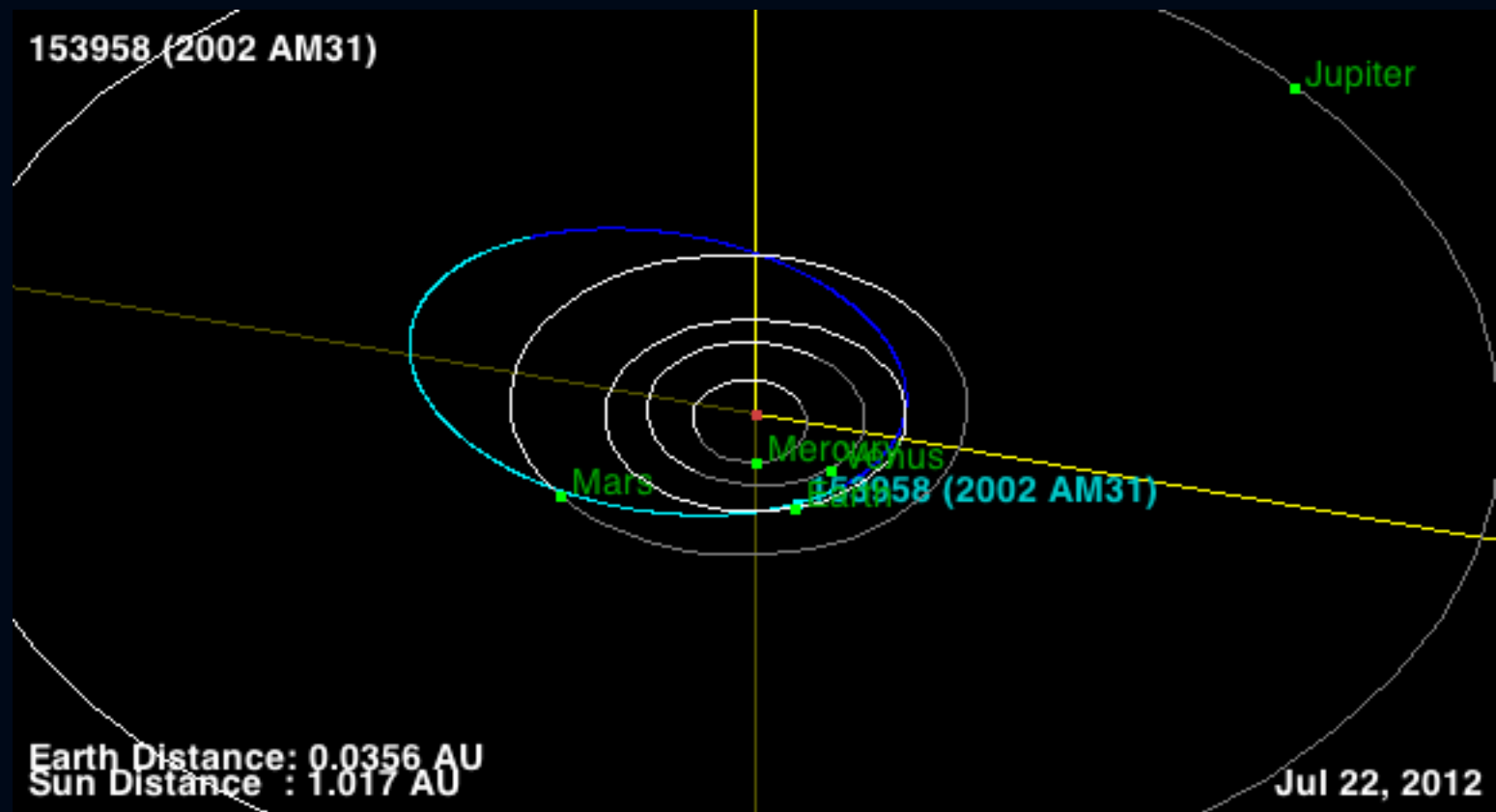
Time-resolved BVRI Photometry

- 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

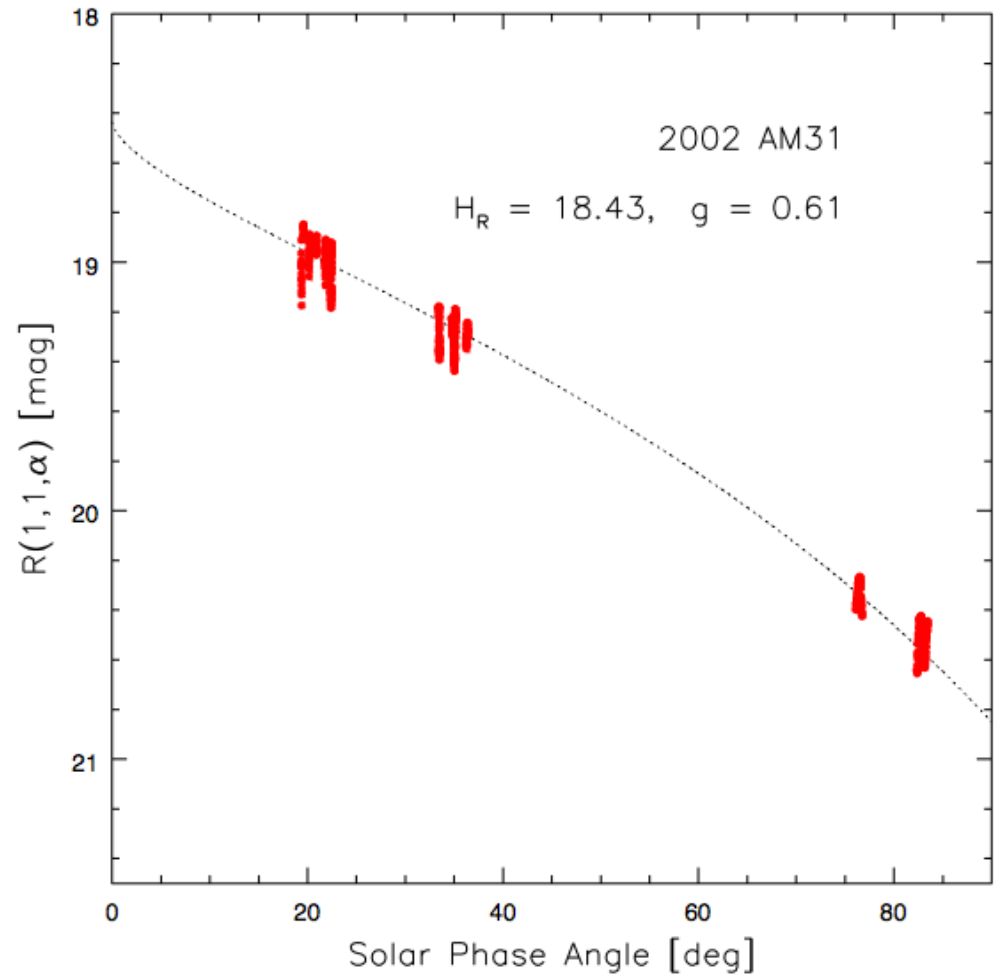
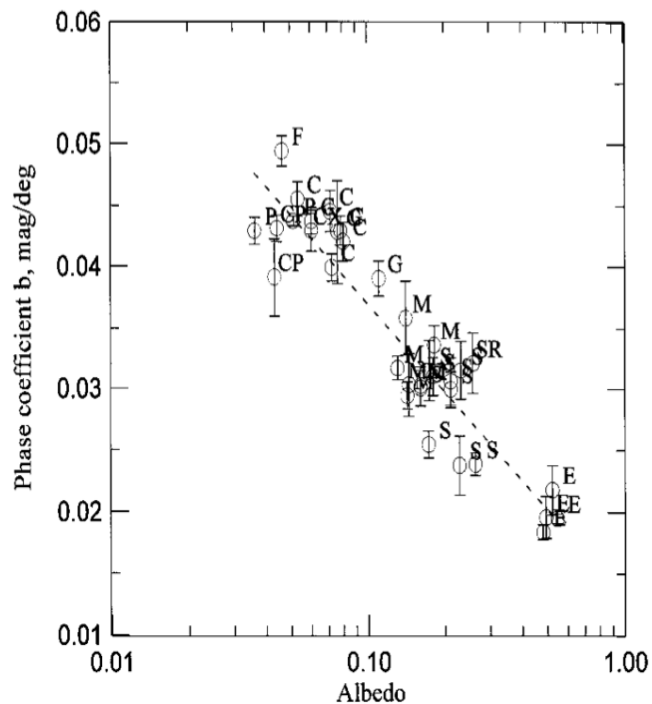
R-I=0.001+/-0.110 mag

MISFIT	OBJECT	NAME	TAXONOMIC (THOLEN)	CLASS (BUS)
1.173	907	Rhoda	C	Xk
1.186	485	Genua		S
1.376	471	Papagena	S	S
1.630	196	Philomela	S	S
1.665	116	Sirona	S	S
1.769	742	Edisona	S	K

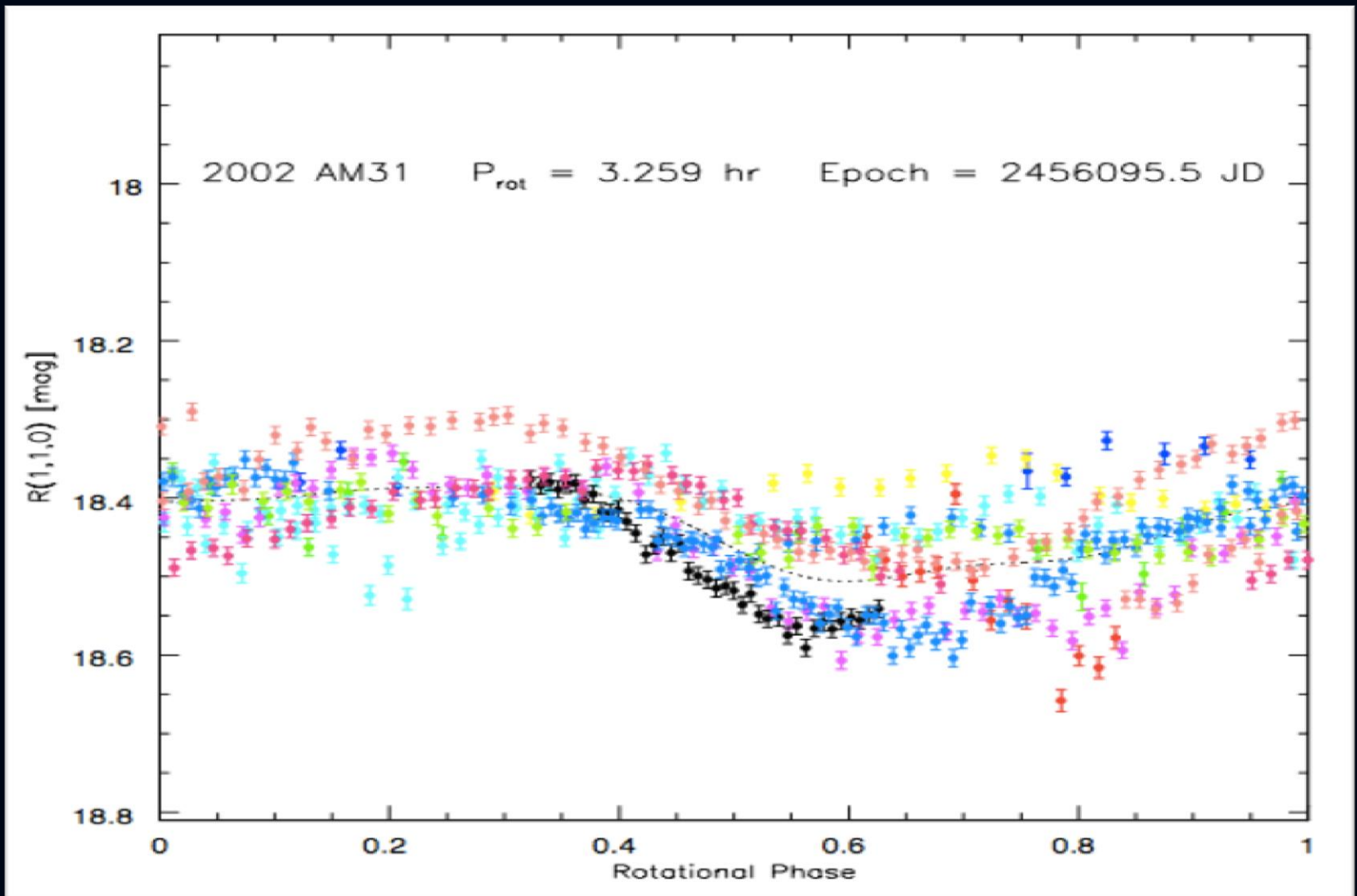
Broadband colors compared to the colors of cataloged asteroids in the SMASS II database suggest S-group Spectral Classification

Solar Phase Curve of 2002 AM31

The slope parameter $G=0.61$ is indicative of a high optical albedo and E-type spectral classification



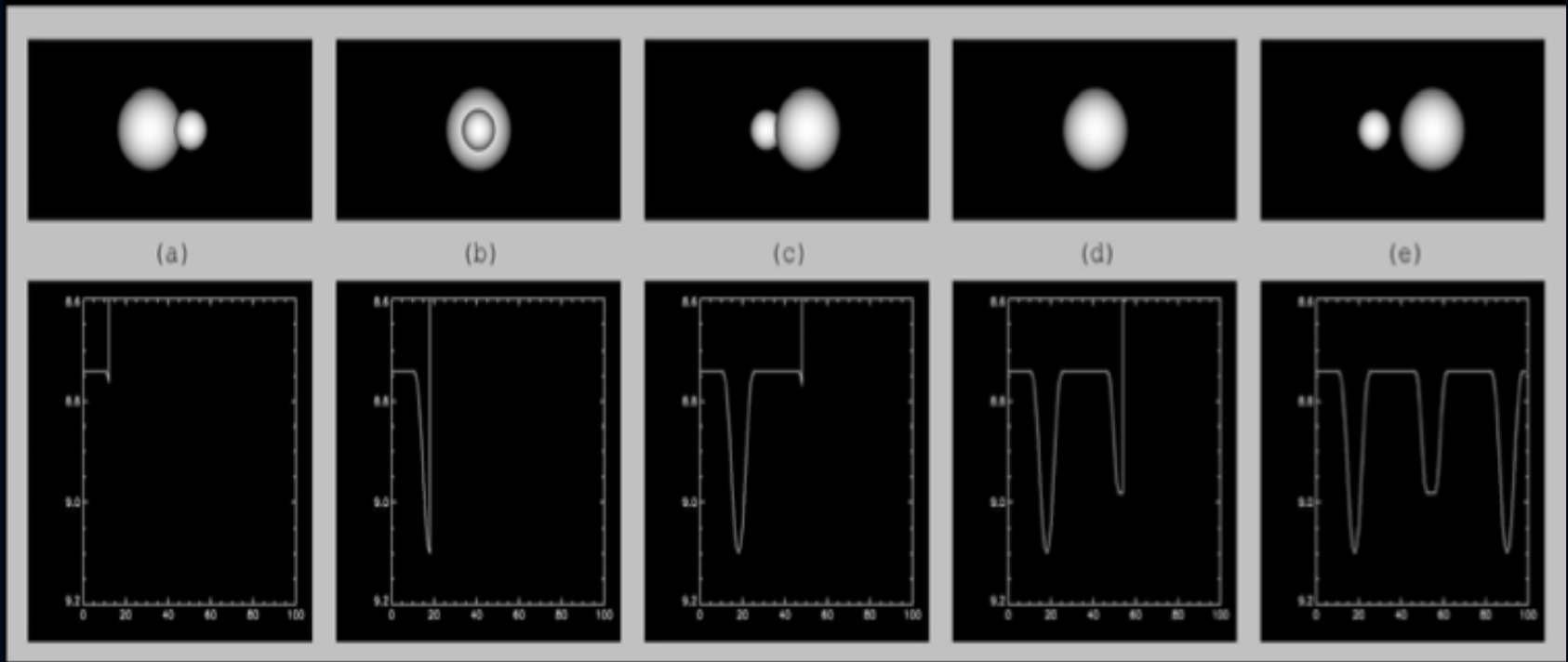
Light Curve of 2002 AM31



Note the dispersion of the phased light curve

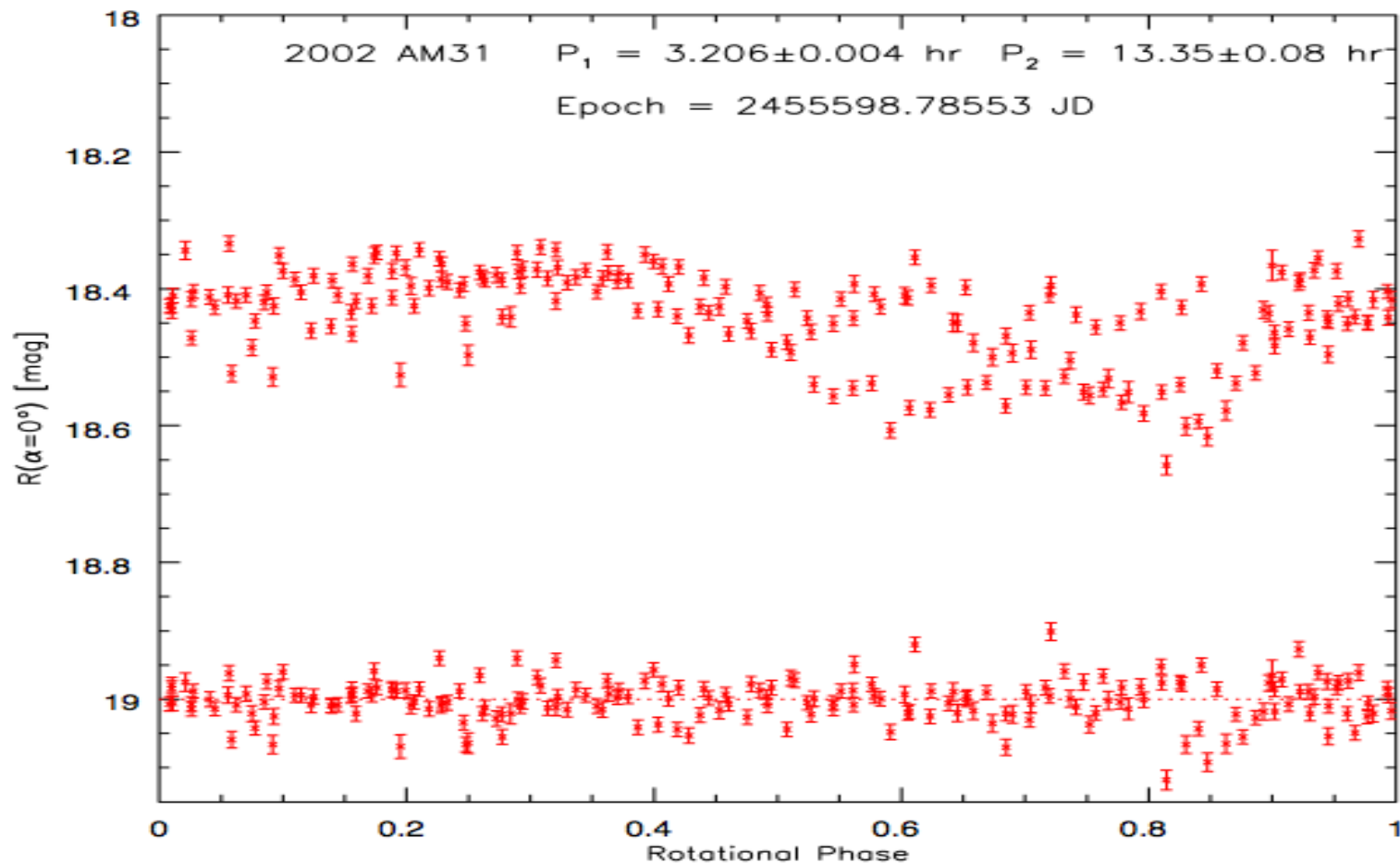
Binary Systems

- 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.

2-period Light Curve Model



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

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So, what does the term CCD stand for? it stands for Charge Coupled Device, Amateur Astronomy, Web. 06 Aug 2012,<http://www.sergepetiot.com/?page_id=173>

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