LIGHT CURVE OF 755 QUINTILLA

Robert K. Buchheim
Altimira Observatory (G76)
18 Altimira, Coto de Caza, CA 92679
rbuchheim@compuserve.com

Donald Pray
Carbuncle Hill Observatory (912)
Greene, Rhode Island
dppray@hotmail.com

(Received: Revised:)

The light-curve rotation period of 755 Quintilla is 4.552 ± .0001 hours, with Δ-mag = 0.38, and its color index is (V-R)= 0.41.

Light curve observations of 755 Quintilla were made at Carbuncle Observatory and Altimira Observatory during April 2004, on dates near the asteroid's opposition. In June 2004, one evening was devoted to determining its color indices. The instruments used are listed in Table 1.

Table 1: Instruments Used

Carbuncle	0.35 m SCT	F/4.1	ST-7 ME
Altimira	0.28 m SCT	F/6.3	ST-8 XE

The position of the asteroid during these observations is given in Table 2.

Table 2: Asteroid Position

UT Date (0 hr)	Distance to Earth (AU)	Distance to Sun (AU)	Phase angle Degrees
4-10-2004	1.7198	2.7160	2.8
4-11-2004	1.7177	2.7156	2.4
4-22-2004	1.7120	2.7121	2.7
4-23-2004	1.7131	2.7119	3.1
4-24-2004	1.7145	2.7116	3.5
6-12-2004 (05:00)	2.0589	2.7052	19.1

Light Curve

No previous light curves have been published for this asteroid. The composite light curve from our observations shows a rotation period of 4.552 ± 0.0001 hours. Our observations, wrapped to this inferred period, are shown in Figure 1. The data sources for Figure 1 are given in Table 3.

Table 3: Data Sources for Figure 1

Date	Observatory	Filter	Exp, sec
4-10-2004	Carbuncle	clear	90
4-11-2004	Carbuncle	clear	90
4-22-2004	Altimira	R	240
4-23-2004	Altimira	R	240
4-24-2004	Altimira	R	240
4-24-2004	Altimira	V	240

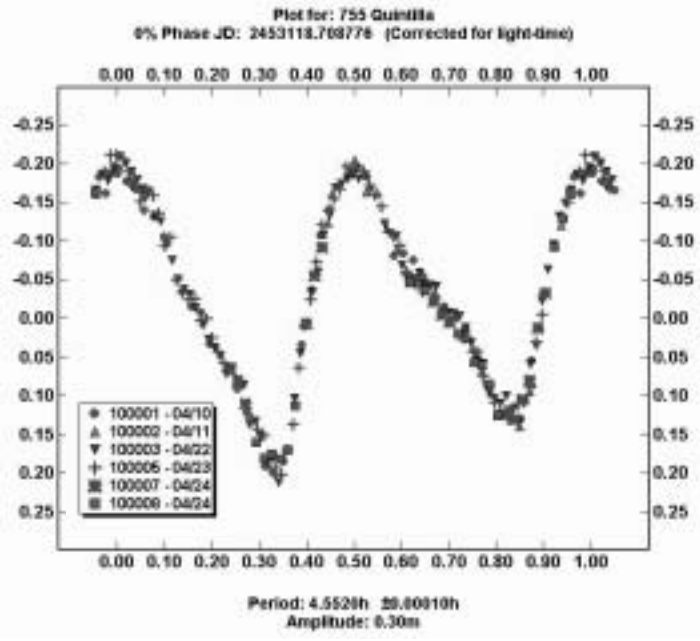

Figure 1: Light curve of 755 Quintilla, wrapped to period = 4.552 hours

The Small Bodies Node (http://pdssbn.astro.umd.edu) reports color index (B-V) = 0.688 ± .029 for this asteroid, and absolute magnitude H= 9.81 (using slope parameter G= 0.15).

On 6-12-2004 UT, Altimira Observatory observed the asteroid in B, V, and R bands, to determine its V-magnitude and color indices.

The transformation coefficients for Altimira Observatory's instrument have been previously determined. They were updated for this project, with no significant change noted during the past 6 months. The nightly zero-point was determined by imaging a Landolt standard field that was fortuitously only a few degrees away from the asteroid, thereby avoiding the need to account for air mass difference. The standard field was measured in B, V, and R filters immediately before and after imaging of the asteroid.

The asteroid imaging sequence was V-R-B-B-R-V. During this 25-minute imaging sequence, the asteroid's rotational phase orientation (referring to Figure 1) ranged from φ = 0.63 to φ = 0.73, so the measured absolute magnitude during this sequence is quite close to the mean brightness (averaged over the light curve).

The measured color indices were:

(B-V) = 0.67 ± 0.06

(which is in good agreement with the Small Bodies Node), and

(V-R) = 0.41 ± 0.03.

The observed V = 14.61, when adjusted for distance from the Earth and Sun gives a reduced magnitude of V_R = 10.88 at solar

phase angle = 19.1 degrees. Using an (assumed) slope parameter G= 0.15, this implies an absolute magnitude of H= 9.9, which is in good agreement with the H= 9.81 reported by the Small Bodies Node.