



# A Change in the Lightcurve of Kuiper Belt Contact Binary (139775) 2001 QG298

[Pedro Lacerda](#)

(Submitted on 18 Jul 2011)

New observations show that the lightcurve of Kuiper belt contact binary (139775) 2001 QG298 has changed substantially since the first observations in 2003. The 2010 lightcurve has a peak-to-peak photometric of range  $\Delta m_{2010} = 0.7 \pm 0.1$  mag, significantly lower than in 2003,  $\Delta m_{2003} = 1.14 \pm 0.04$  mag. This change is most simply interpreted if 2001 QG298 has an obliquity near 90 deg. The observed decrease in  $\Delta m$  is caused by a change in viewing geometry, from equator-on in 2003 to nearly 16 deg (the orbital angular distance covered by the object between the observations) off the equator in 2010. The 2003 and 2010 lightcurves have the same rotation period and appear in phase when shifted by an integer number of full rotations, also consistent with high obliquity. Based on the new 2010 lightcurve data, we find that 2001 QG298 has an obliquity  $\{\epsilon\} = 90 \pm 30$  deg. Current estimates of the intrinsic fraction of contact binaries in the Kuiper belt are debiased assuming that these objects have randomly oriented spins. If, as 2001 QG298, KBO contact binaries tend to have large obliquities, a larger correction is required. As a result, the abundance of contact binaries may be larger than previously believed.

Comments: 28 pages, 10 figures, 5 tables. Accepted for publication in The Astronomical Journal (2011 July 18)

Subjects: **Earth and Planetary Astrophysics (astro-ph.EP)**

Cite as: [arXiv:1107.3507](#) [astro-ph.EP]

(or [arXiv:1107.3507v1](#) [astro-ph.EP] for this version)

## Submission history

From: Pedro Lacerda [[view email](#)]

[v1] Mon, 18 Jul 2011 17:24:46 GMT (1113kb,D)

*[Which authors of this paper are endorsers?](#)*

## Download:

- [PDF](#)
- [Other formats](#)

Current browse context:

astro-ph.EP

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1107](#)

Change to browse by:

[astro-ph](#)

## References & Citations

- [INSPIRE HEP](#)  
([refers to](#) | [cited by](#))
- [NASA ADS](#)

Bookmark([what is this?](#))

