





Erratum: “Photometry of Active Centaurs: Colors of Dormant Active Centaur Nuclei” (2019, AJ, 157, 225)

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1. Misidentified Object: P/2008 CL94

In Wong et al. (2019), we reported color measurements and activity constraints for the known active Centaur P/2008 CL94. At the time of our observations at Palomar Observatory on 2017 August 21, the positional uncertainty of the object reported by the JPL Horizons database was large, exceeding 100'' in R.A. at 3σ . Nevertheless, the entirety of the 3σ uncertainty ellipse was contained within the detector array. We utilized both automated moving object finding and careful visual inspection to search for the target in our images. We recovered a single moving object with a compact star-like point-spread function (PSF) that was located within the 1σ uncertainty region, and had on-sky rates in both the R.A. and decl. directions that were roughly consistent with the JPL Horizons calculations. In addition, the measured *V*-band apparent magnitude (20.75 ± 0.03) was a good match to the JPL Horizons prediction (20.9), and we computed a visible spectral slope that was consistent with the previously reported measurement by Kulyk et al. (2016).

Subsequent observations by Schambeau et al. (2021) on 2021 January 9 and 15 using the Gemini Multi-Object Spectrograph independently recovered P/2008 CL94 and detected a compact PSF with no evidence of cometary activity. At the time, the Centaur was located at a heliocentric distance of 5.46 au, closer than it was during the epoch of our Palomar observations (6.33 au). However, Schambeau et al. (2021) measured a significantly fainter *r'*-band magnitude of 22.70 ± 0.04 when compared to our reported *R*-band magnitude of 20.27 ± 0.02 , leading to inconsistent nucleus size estimates. After the Gemini observers contacted our team, we revisited our Palomar images and used the MPCChecker tool⁵ to query for other known moving objects in the field. We discovered that the target we identified to be P/2008 CL94 was actually the (inactive) main-belt asteroid (270262) 2001 UY127, which had a near-identical on-sky motion and apparent brightness on the night of 2017 August 21.

The Gemini team provided us with a new position prediction for P/2008 CL94 based on their updated ephemeris. No apparent sources were found in our Palomar images down to a limiting *R*-band magnitude of ~ 23.5 . We conclude that the cessation of cometary activity on P/2008 CL94 since the last reported active phase in 2009 (Kulyk et al. 2016) caused significant dimming, rendering it unrecoverable in our Palomar observations. This change in apparent brightness is not accounted for in the JPL Horizons predictions, which continues to display apparent magnitudes that are derived from earlier active-phase brightness measurements.

We note that while our misidentification invalidates the brightness, color, and activity constraints reported in Wong et al. (2019) for P/2008 CL94, the discussion of the object’s activity history and our subsequent comparative analysis of the active and inactive Centaur color distributions are not affected by this mistake, given the existence of the previously published spectral slope value from Kulyk et al. (2016), which is consistent with our erroneous color measurement.

We sincerely regret this oversight and offer this erratum as a cautionary tale for planning future follow-up observations of active objects and asteroids with large positional uncertainties.

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References

Kulyk, I., Korsun, P., Rousselot, P., Afanasiev, V., & Ivanova, O. 2016, *Icar*, 271, 314

Schambeau, C., Fernandez, Y., Micheli, M., et al. 2021, CBET, 4992
Wong, I., Mishra, A., & Brown, M. E. 2019, *AJ*, 157, 225

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