

Study of the active asteroid (6478) Gault*

Albino Carbognani¹[0000-0002-0737-7068], Alberto Buzzoni¹, and Giovanna Stirpe¹

INAF - Osservatorio di Astrofisica e Scienza dello Spazio, Via Gobetti 93/3, 40129 Bologna, Italy albino.carbognani@inaf.it

Abstract. We report dense lightcurve photometry, BVR_c colors and phase - mag curve of (6478) Gault, an active asteroid with sporadic comet-like ejection of dust. We collected optical observations along the 2020 Jul-Nov months during which the asteroid appear always star-like, without any form of perceptible activity. We found complex lightcurves, with low amplitude around opposition and a bit higher amplitude far opposition, with a mean rotation period of $2.46_{\pm 0.02}$ h. Significant shape changes were observed in the phased lightcurves after opposition, a probable indication of concavities and surface irregularities. We suspect the existence of an Amplitude-Phase Relationship in C band. The mean colors are $B - V = +0.84_{\pm 0.04}$, $V - R_c = +0.43_{\pm 0.03}$ and $B - R_c = +1.27_{\pm 0.02}$, compatible with an S-type asteroid, but variables with the rotational phase index of a non-homogeneous surface composition. From our phase - mag curve and Shevchenko's empirical photometric system, the geometric albedo result $p_V = 0.13_{\pm 0.04}$, lower than the average value of the S-class. We estimate an absolute mag in V band of about +14.9 and this, together with the albedo value, allows to estimate a diameter of about 3-4 km, so Gault may be smaller than previously thought.

Keywords: Minor Planets · Asteroids · (6478) Gault.

* Based on observations collected at the Cassini Telescope of the Loiano Observatory, Italy