

MULTIPLE CLOSE FREQUENCES OF THE δ SCUTI STAR θ^2 TAU: THE SECOND MULTISITE CAMPAIGN

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Abstract. Multisite photoelectric b and V photometry of the δ Scuti variable $\theta^2(78)$ Tau has been obtained on three continents. Five close pulsation frequencies (13.22965, 13.48073, 13.69360, 14.31764 and 14.61454 cycles per day) with visual amplitudes between 0.001 and 0.007 mag were found. The four frequencies found in the previous campaign were confirmed. All three main data sets (1982-1986) are in excellent agreement with each other and fit the solution to ± 0.0028 mag per single measurement. Over the four years the amplitudes and frequencies of pulsation were constant.

The measured (O-C) values relative to the five-frequency solution are in agreement with the predicted 141-day orbital light-time effects in the binary system and show pulsation of the more massive component. The pulsational Q values of 0.017 to 0.019 days indicate a pulsation in the second or higher overtone ($K \geq 2$). The pattern of frequency spacing cannot be explained by either radial pulsation or rotational splitting alone. The pulsation consists of a complex mixture of modes with different l and m values.