As a byproduct of the ongoing work with the Catalog and All of Eclipsing Binaries database (CALEB), Bradstreet et al. (2004), several hundred eclipsing binary systems have been identified that have either unpublished or poor quality light curves. We present new V & R\textsubscript{C} light curves for the overcontact systems PP Lac and DK Sge, both chosen because their reported deep eclipses (peak-to-peak amplitudes of nearly 0.7 mag) prompted us to hope the light curve modeling. Data were obtained using the 41-cm telescope at the Eastern University Observatory equipped with an SBIG ST-7XME CCD.

PP Lac (P=0.4016 d) is a W-type contact binary with only one previously published light curve (Dumont & Maraziti 1990), but their data are sparse and almost non-existent at primary eclipse. Modelling of these data gave varying results; the published mass ratios differ by nearly 0.3. Our data confirms the noted differing eclipse depths but we find the primary eclipse to be total. PP Lac was observed from 13 September 2004 through 3 October 2004, resulting in 1044 observations in V and 969 in R\textsubscript{C}. These data were binned into 200 normal points in flux units and analyzed using Binary Maker 3 (Bradstreet & Steelman 2002) and Wilson-Devinney (1971, 1979, 1992). The mass ratio was well-constrained by the duration of total eclipse and excellent fits were achieved. Our results are in between those published by Gasparrini (1990) and Al-Naimiy & Al-Hindawy (1992). However, these previous analyses used the only existing published light curve of PP Lac which had large scatter as well as incomplete phase coverage. The parameters for the system are given in the table below. Analysis of the O-C diagram of PP Lac revealed a period decrease of -1.162 x 10\textsuperscript{-2} sec/yr and is shown below.

DK Sge (P=0.6216 d) appears to be an A-type contact binary with no published light curve. The eclipses are partial, with the primary eclipse being deeper by about 0.08 mag. The maxima show evidence of a significant asymmetry, especially in the V bandpass. The asymmetry in the light curve persisted over the 1 month of observations. DK Sge was observed from 31 August 2004 through 30 September 2004, resulting in 794 observations in V and 765 in R\textsubscript{C}. These data were binned into 200 normal points in flux units and analyzed similarly to PP Lac. Due to the large asymmetry in the light curves, only the normal points from 0.03P to 0.50P were subjected to the final analysis by differential corrections because this section of the light curves seemed the least distorted. The debiased part of the light curves (from 0.05P to 0.50P) was manually modeled with two cool spots on the larger star. After many trials we were unable to simultaneously fit the suppression in the primary and secondary minima. Analysis of the O-C diagram of DK Sge revealed a period increase of +1.387 x 10\textsuperscript{-2} sec/yr and is shown below.

Individual V (green dots) and R\textsubscript{C} (red dots) observations of PP Lac and DK Sge.

New Light Curves and Analyses of the Overcontact Binaries PP Lac and DK Sge

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