Fourier analysis of variable stars using regularized regression

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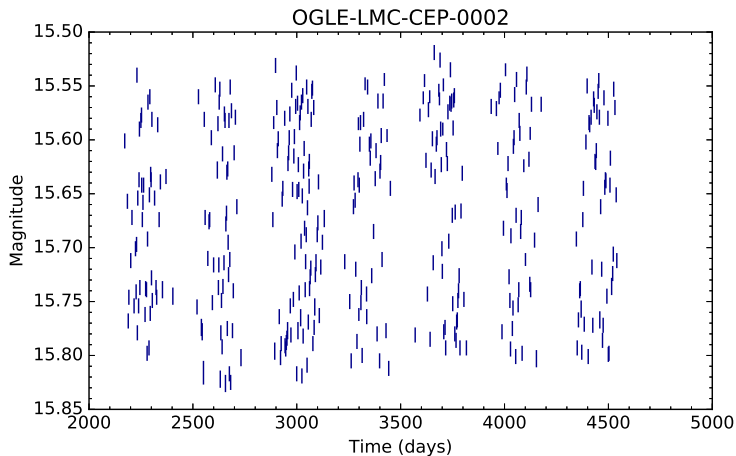
Light Curve

Figure: Raw light curve
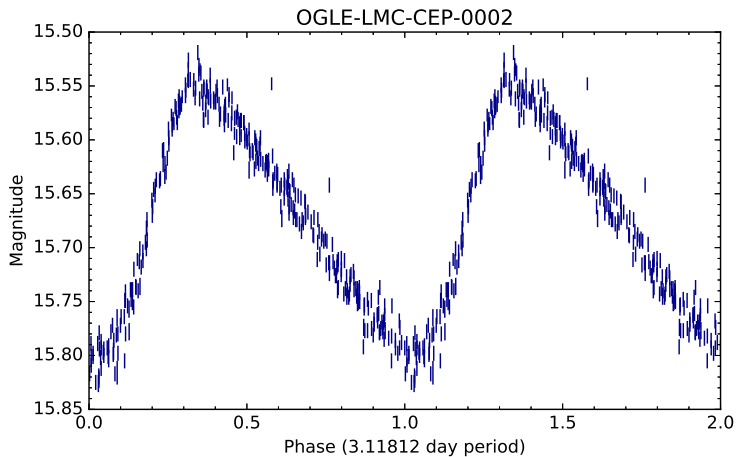
Phased Light Curve

Figure: Phased light curve

Fourier Series

$$m(t) = A_0 + \sum_{k=1}^{n} A_k \cos(k\omega t + \Phi_k)$$
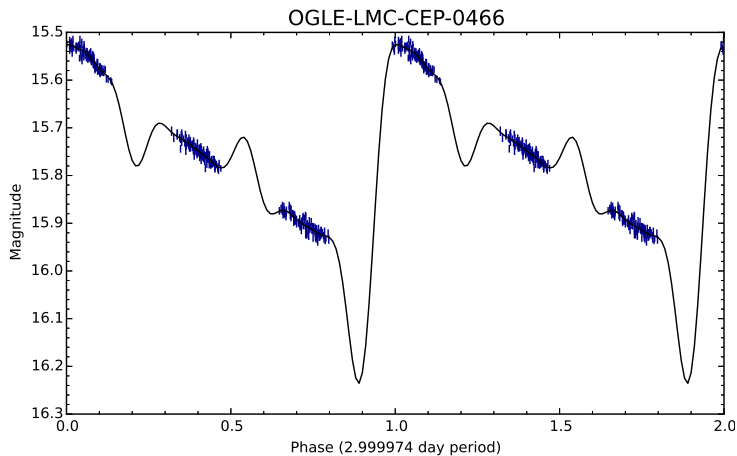
Unconstrained Regression Fit

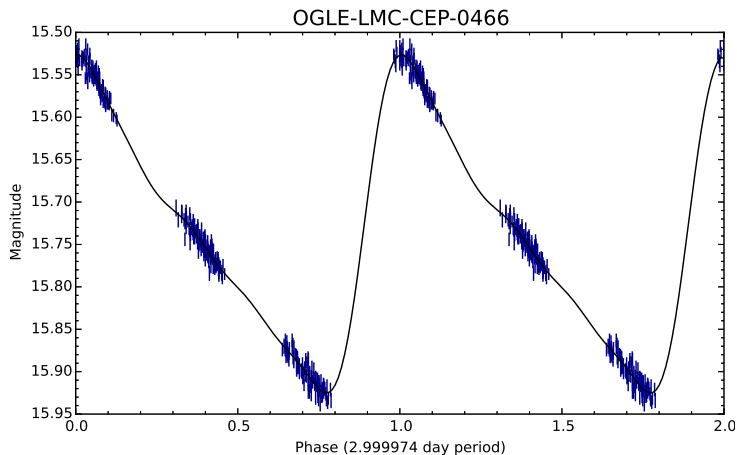Figure: 10th order fit using ordinary linear regression

Regularized Regression Fit

Figure: 10th order fit using LASSO and cross validation