

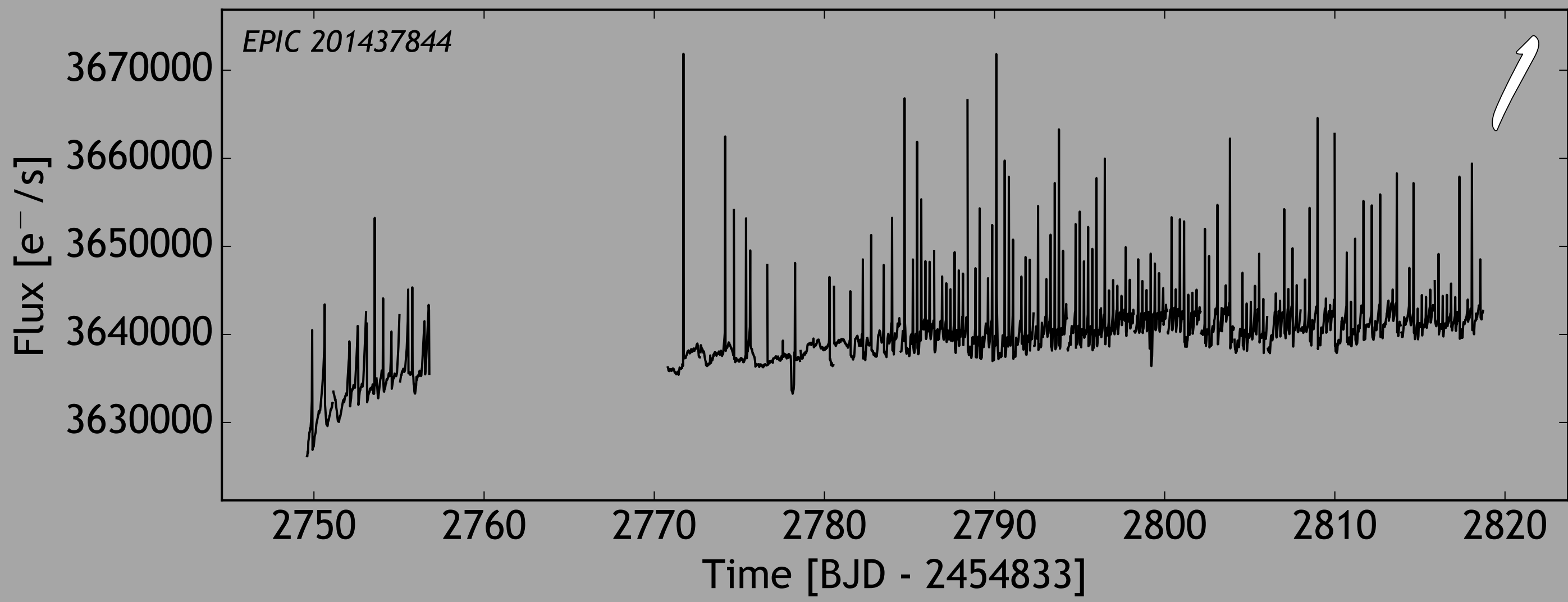
# A Transit-Searching Pipeline for CHEOPS Candidates from K2

Helen Giles | Daniel Bayliss | Christophe Lovis | Stéphane Udry

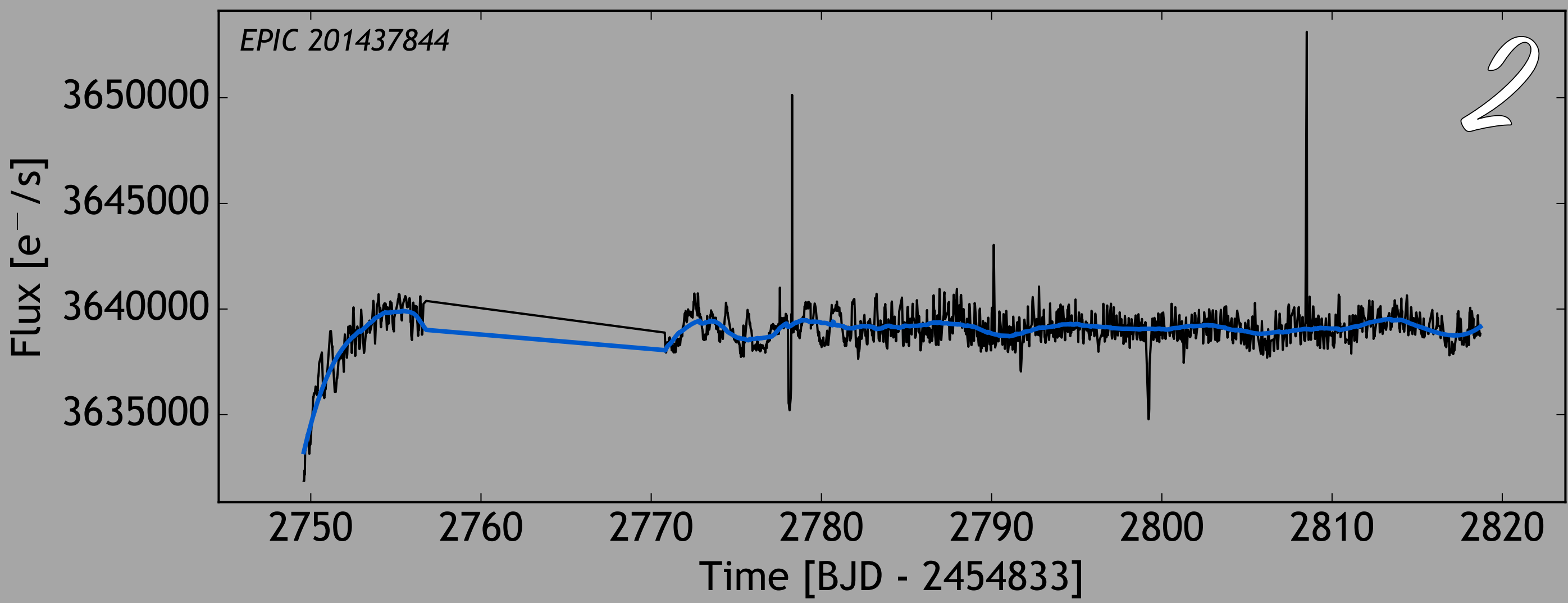
## Introduction

The K2 mission is a valuable source of targets for CHEOPS, because its target fields match perfectly to CHEOPS observable sky. We aim to create a pipeline to discover transiting exoplanets in the K2 datasets. Aspects of pipeline will also be used on future datasets and TESS. The pipeline first flattens and sigma-clips the light curves, then searches for transits using a Box-fitting Least Squares (BLS) routine. Then a transit model is fitted to those which appear to have transits.

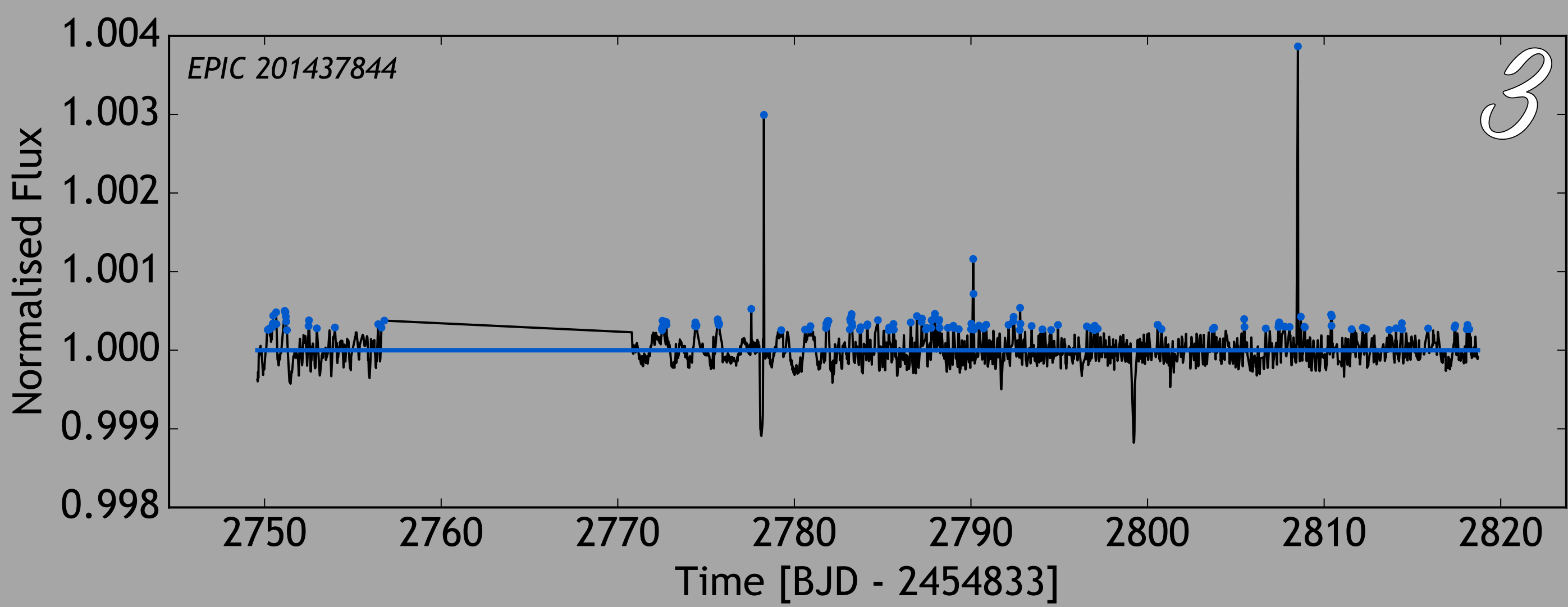
## The Pipeline



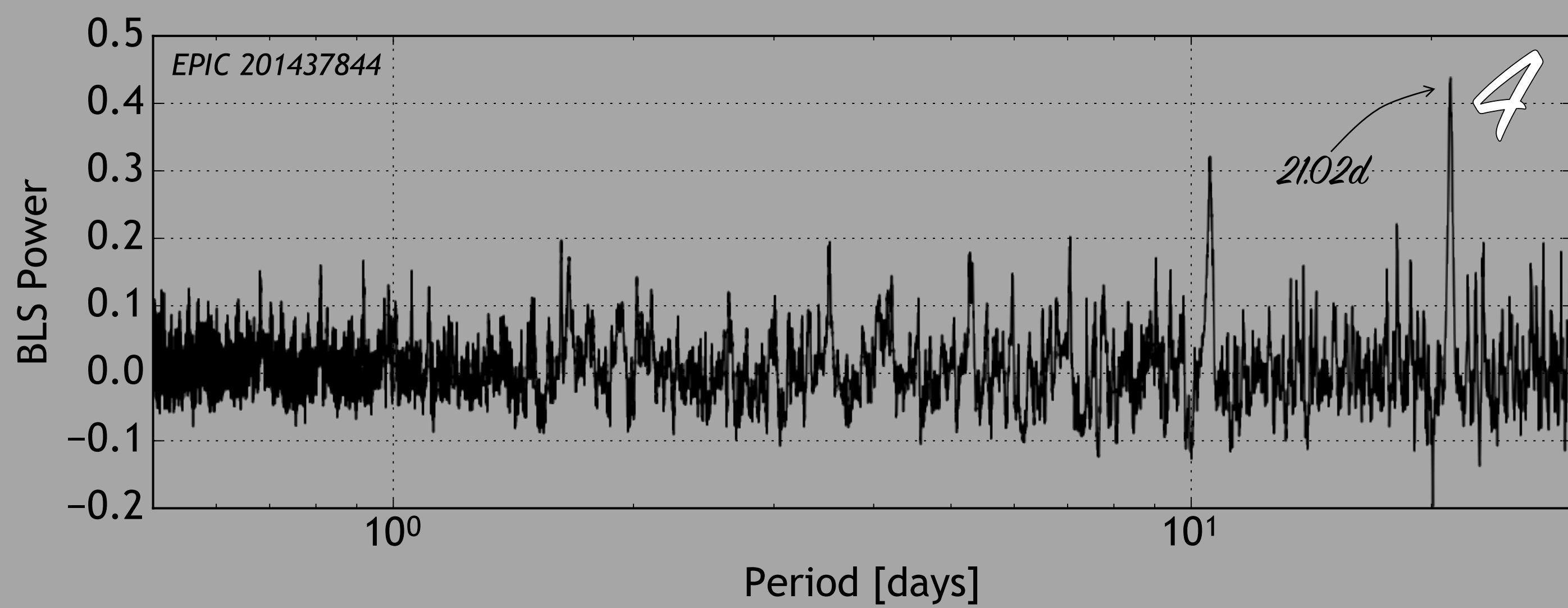
Raw light curves are extracted by the K2 team and show long-term brightness variations including a significant 6-hour trend.



The K2 teams de-trend the light curves to remove the majority of space craft systematics. We then fit with a varying polynomial (blue).



Remove the polynomial fit to flatten the light curves and eliminate all significant positive outliers.



The flattened light curves are used to search for exoplanet transits with BLS (Kovács et al., 2002).

$P = 21.02d$ ,  $t_{dur} = 3.383h$ ,  $t_{dep} = 0.099\%$   
RA: 183.4, Dec: -0.39,  $Kep_{mag} = 9.234$

201437844 (C10)

### BLS Results

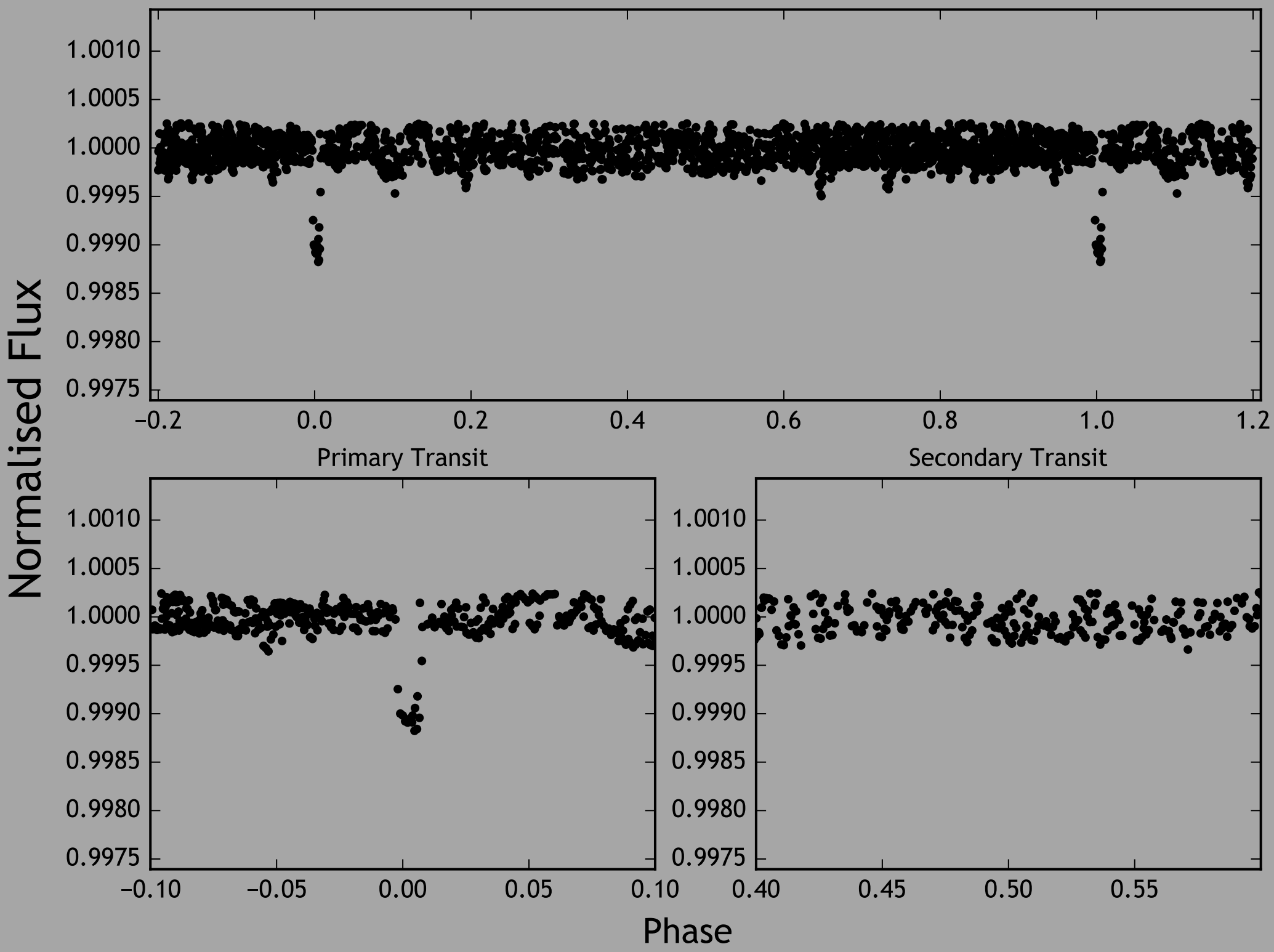
Folded at the best period shows the transit. Depth is  $\sim 0.099\%$ , which suggests a  $\sim 4R_{\oplus}$  planet.

Basic vetting includes looking at primary transits and secondary transits. A transit curve can be fitted to determine planetary parameters.

### Future Prospects

Bright candidates will be passed onto Coralie, HARPS and later to CHEOPS and ESPRESSO.

Pipeline can also be used to search for transits in TESS data (expected to be released in 2018).



## Additional Resources

The Data & Analysis Center for Exoplanets (DACE) is a publicly available web platform based at the University of Geneva dedicated to exoplanet data visualisation, exchange and analysis. RVs, light curves and imaging measurements are available as well as sophisticated analysis tools. The platform can also run long computations. DACE is funded by the Swiss National Centre of Competence in Research (NCCR) PlanetS, federating the Swiss expertise in exoplanet research.

Publically available at this address :

[dace.unige.ch](http://dace.unige.ch)

