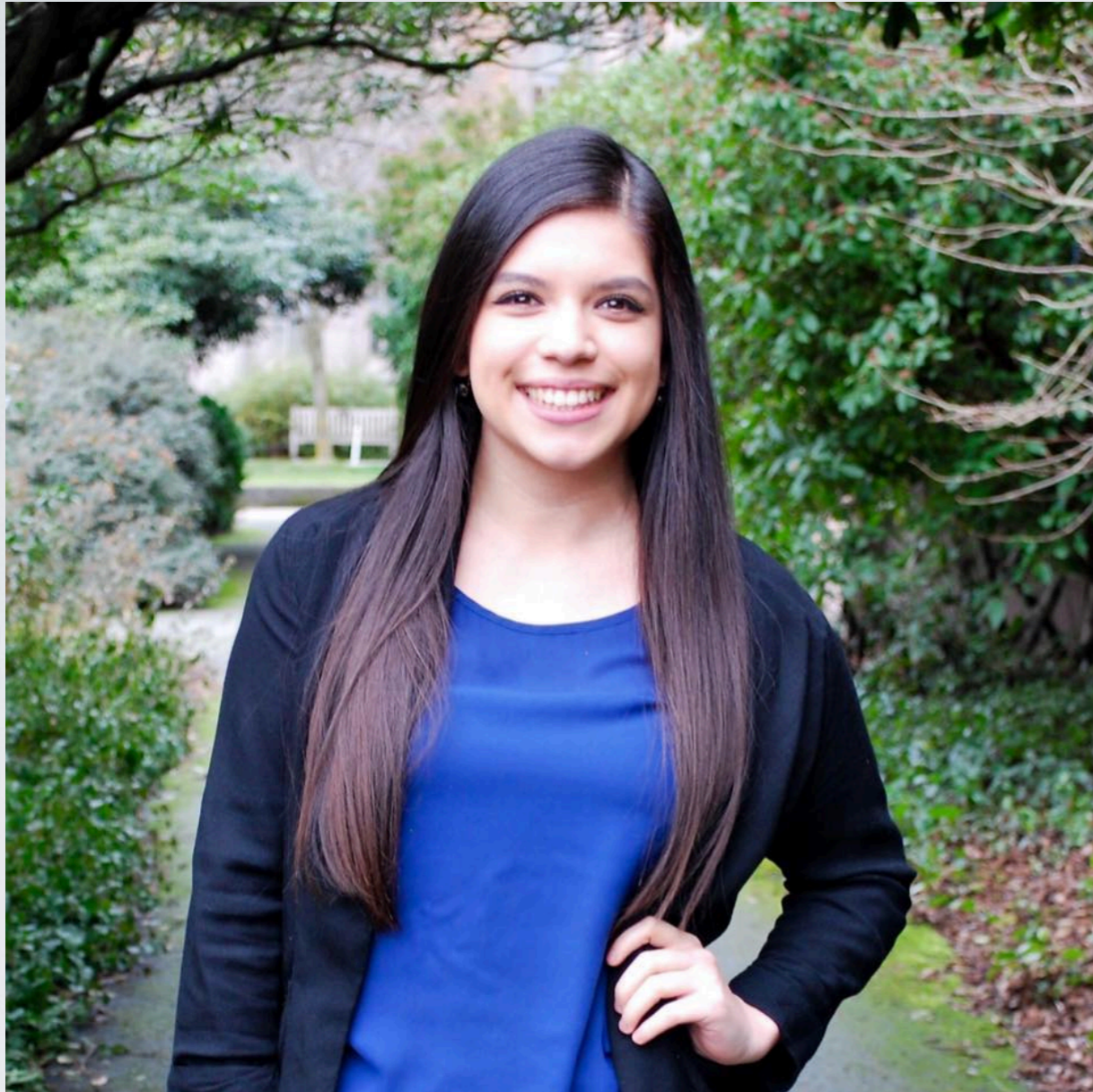


SCIENCE WITH *KEPLER'S* FULL FRAME IMAGES

Benjamin Montet
NASA Sagan Fellow, University of Chicago

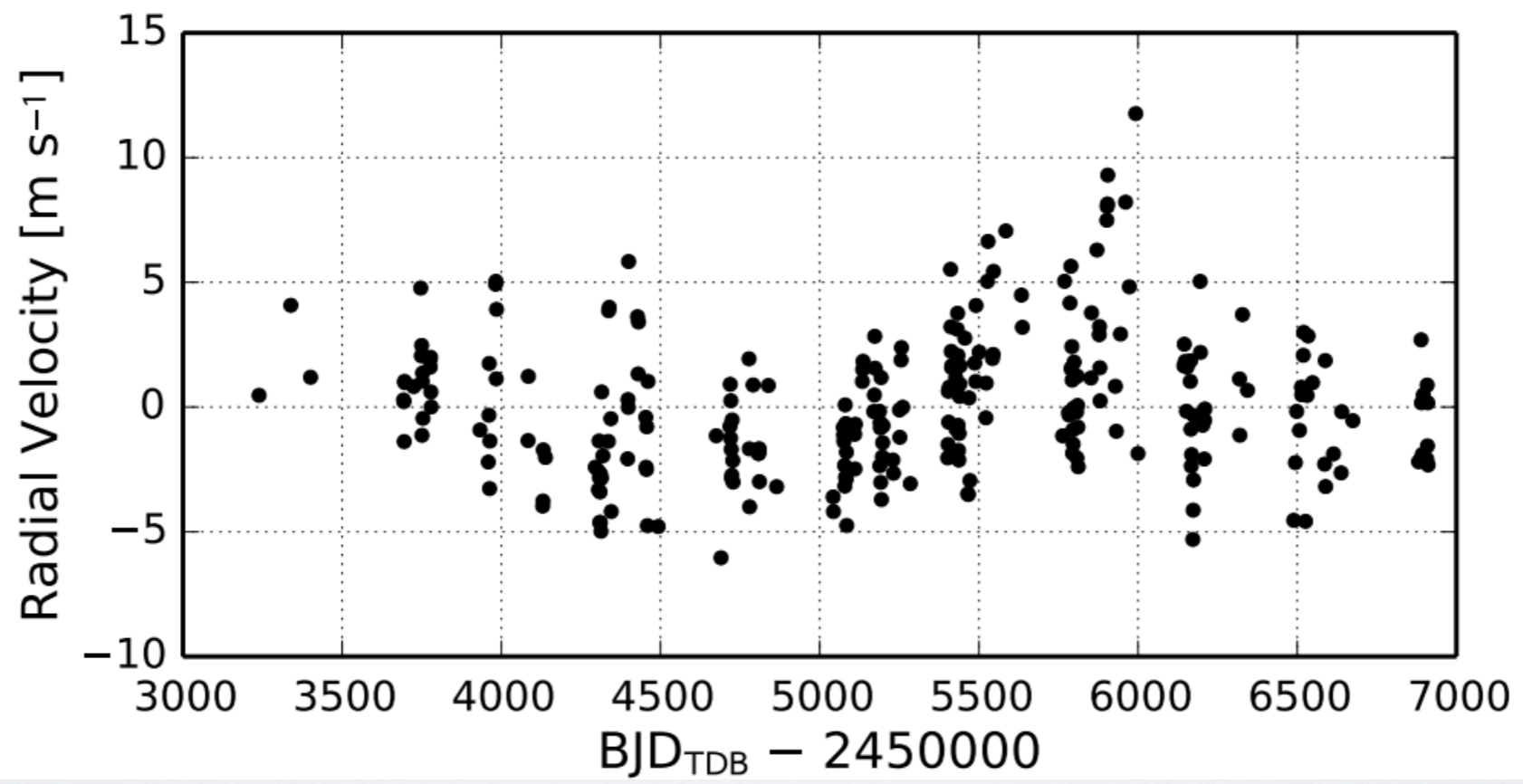
Sagan/Michaelson Symposium
9 November 2017

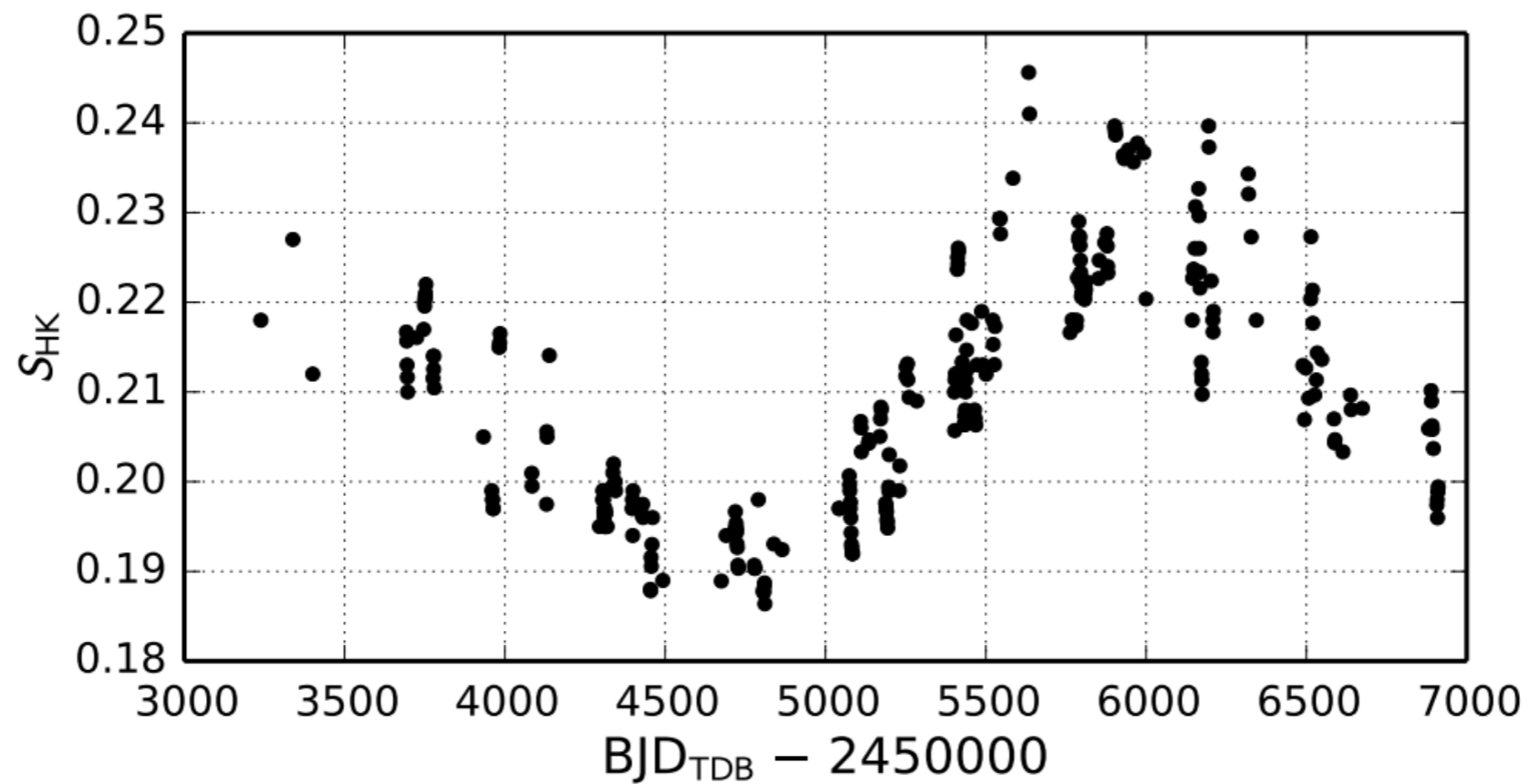
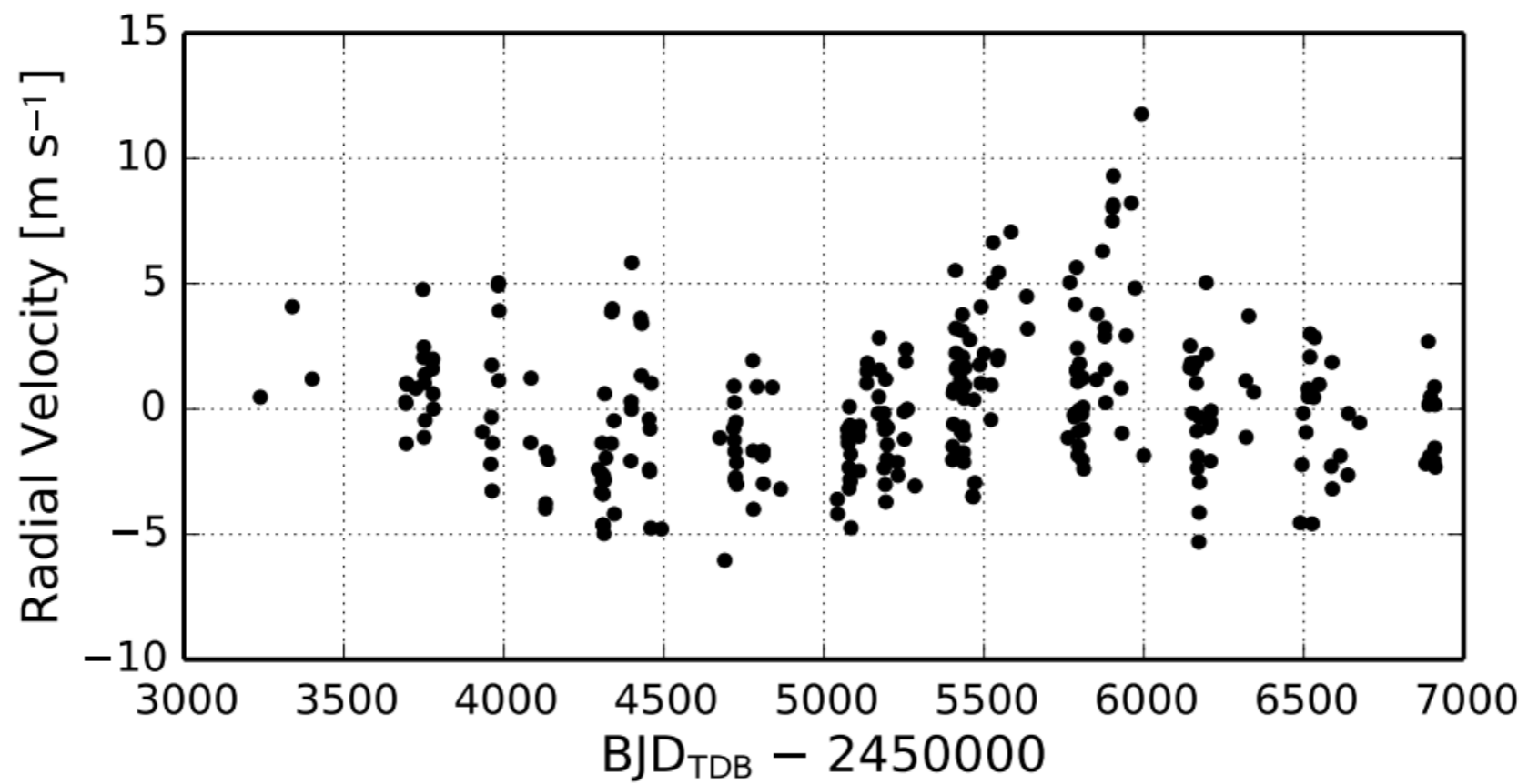


Guadalupe Tovar (UW)

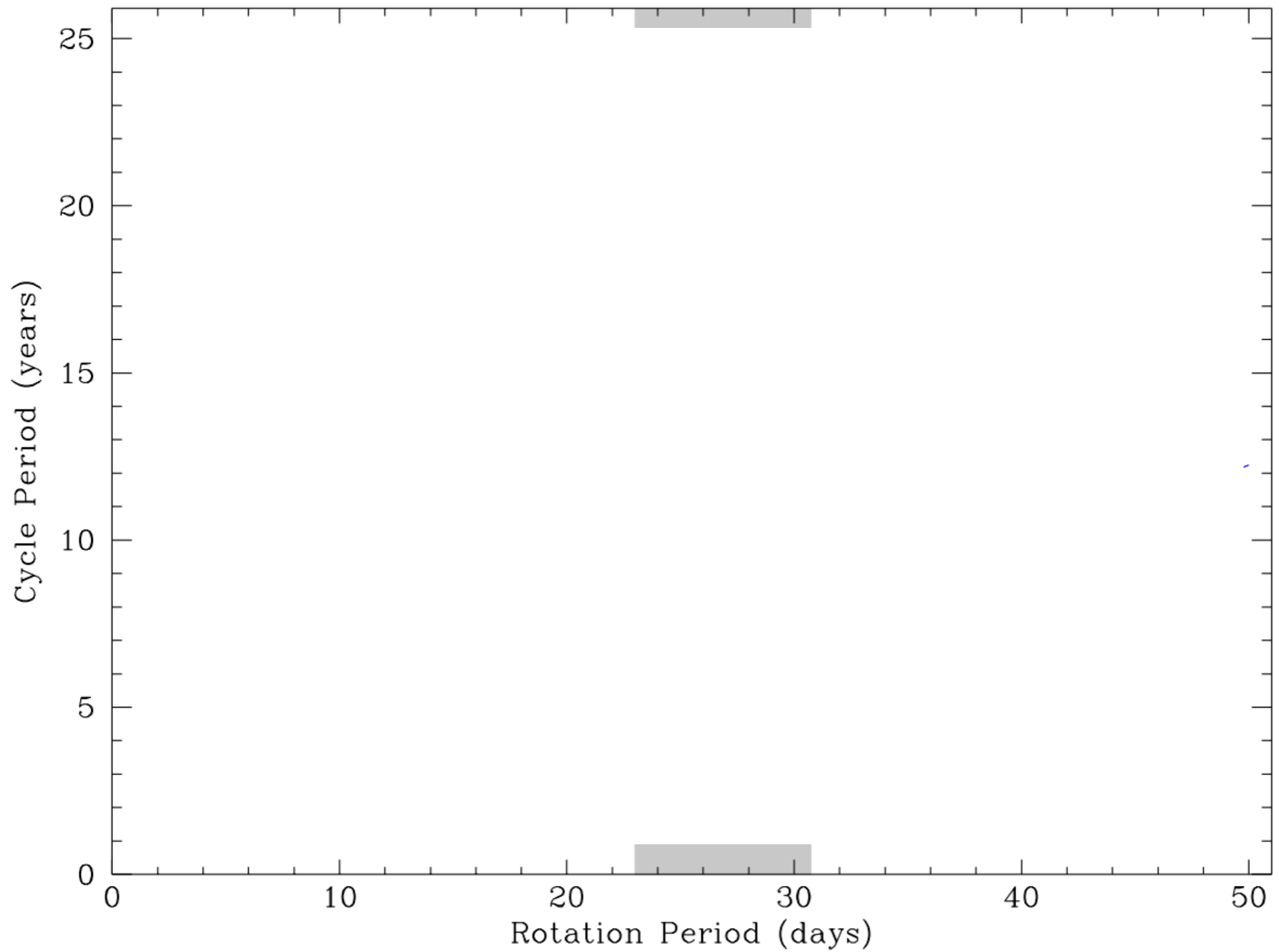


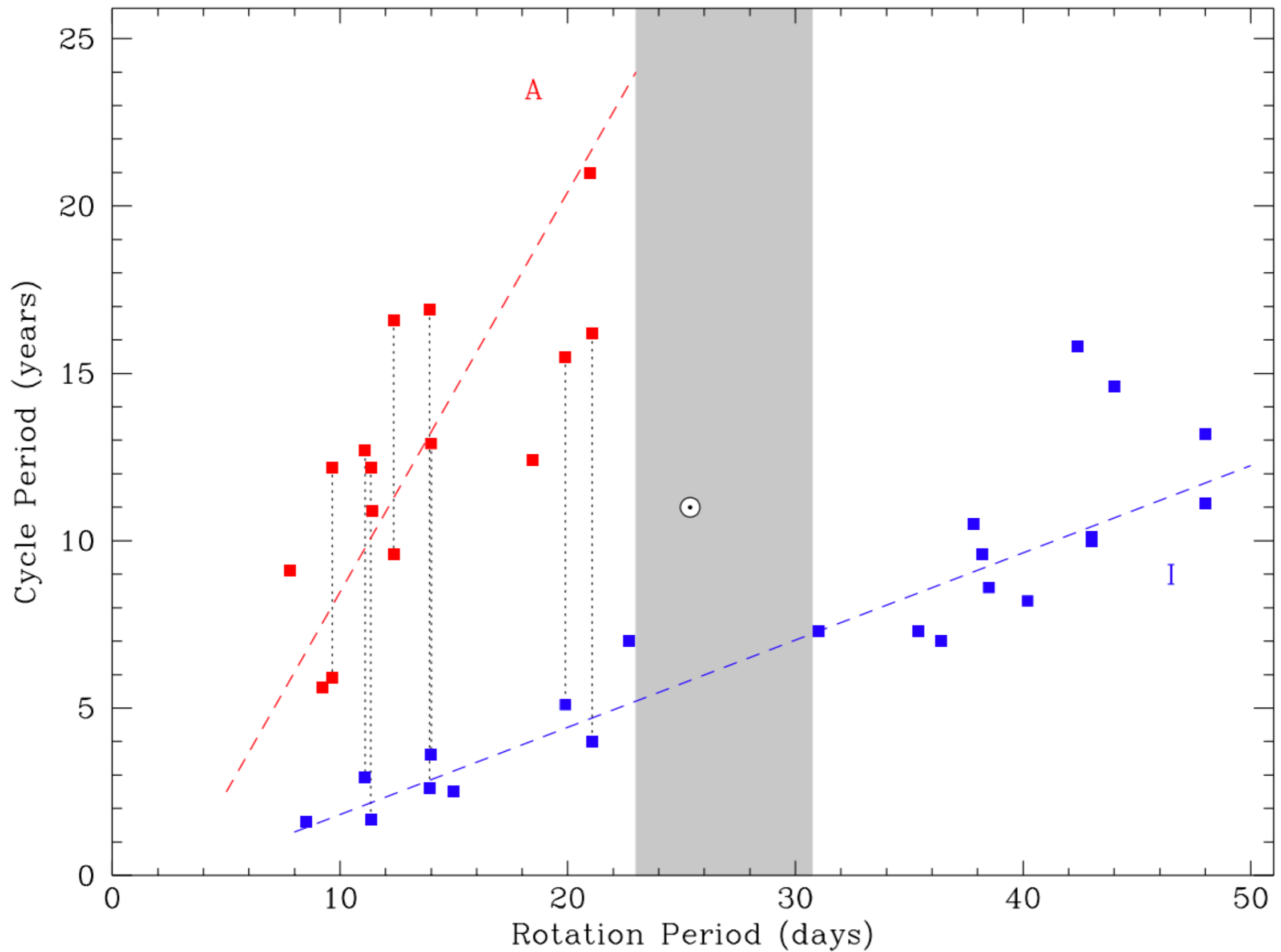
Dan Foreman-Mackey (Flatiron)



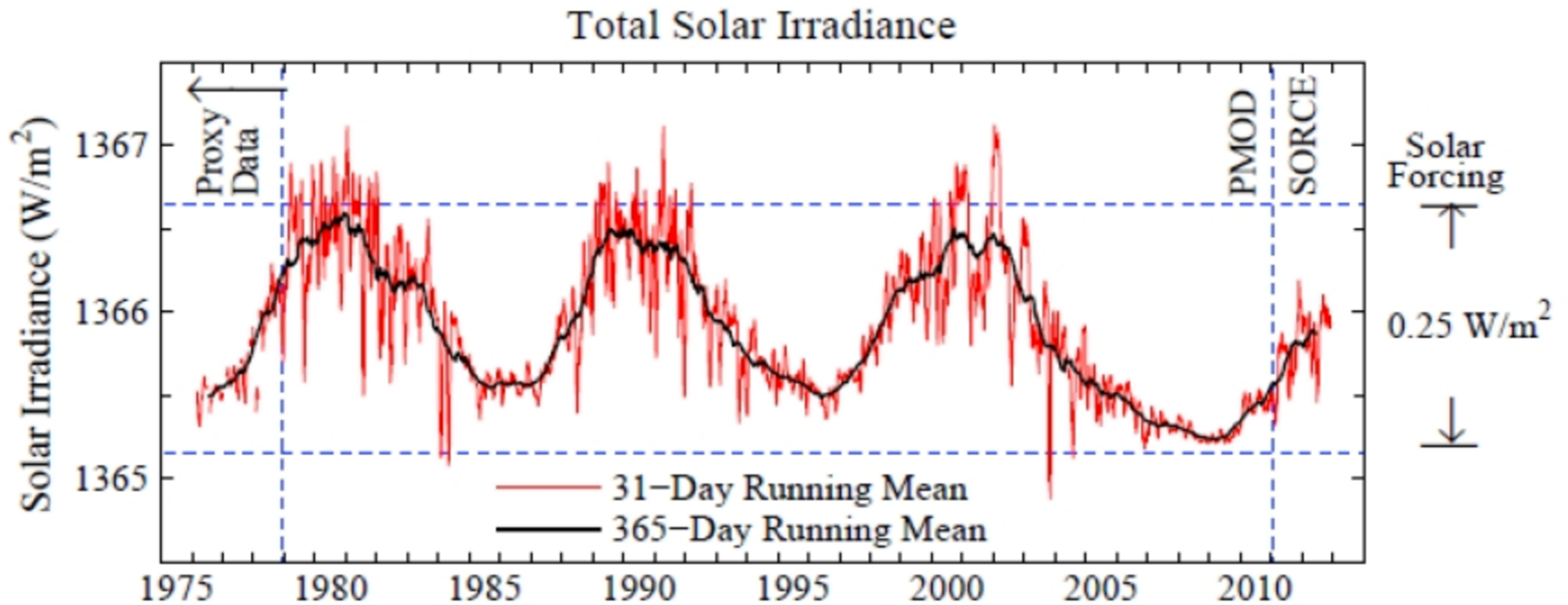


OUR KNOWLEDGE OF
STELLAR ACTIVITY
IS **LIMITED**
BY OUR
SMALL SAMPLE





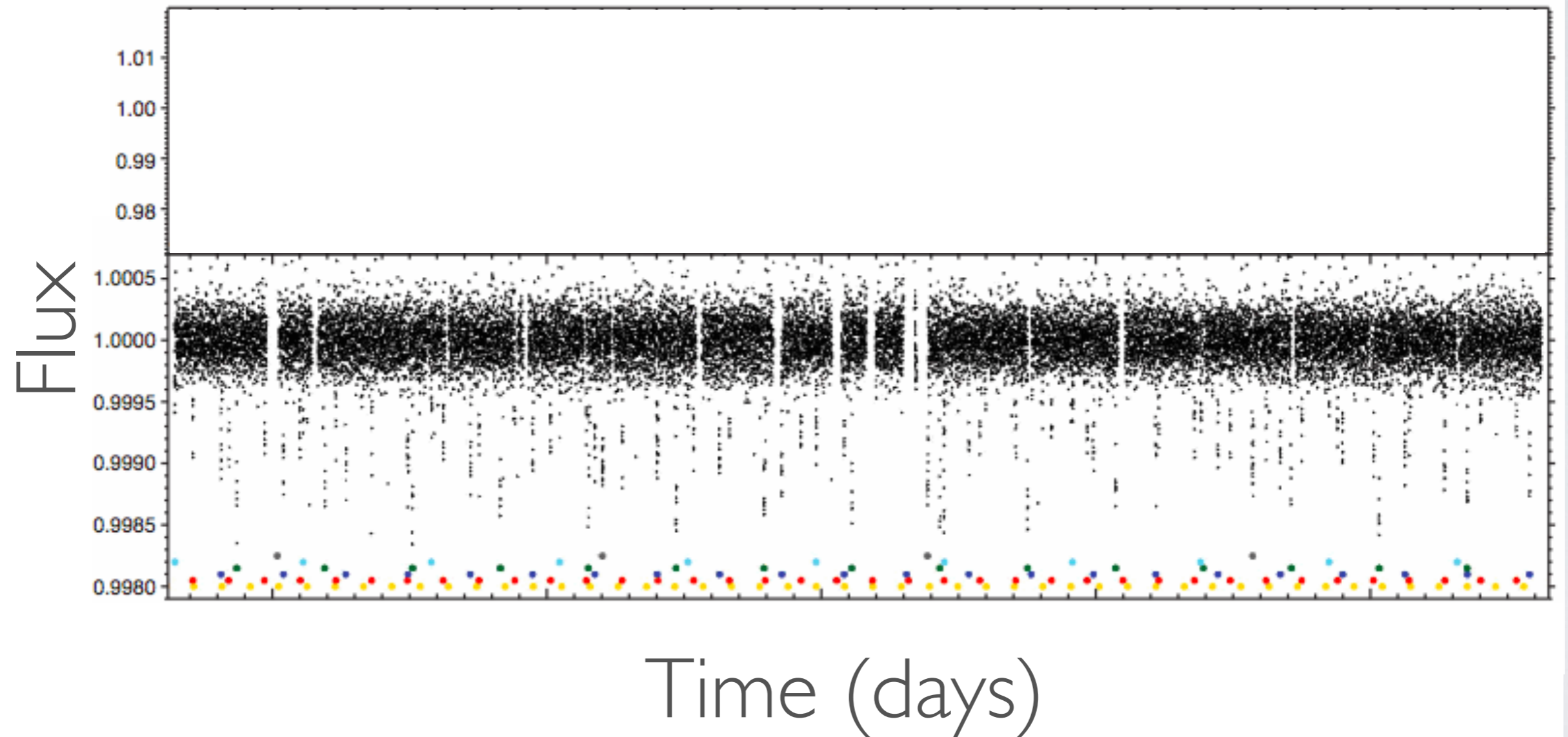
STELLAR ACTIVITY VIA PHOTOMETRY



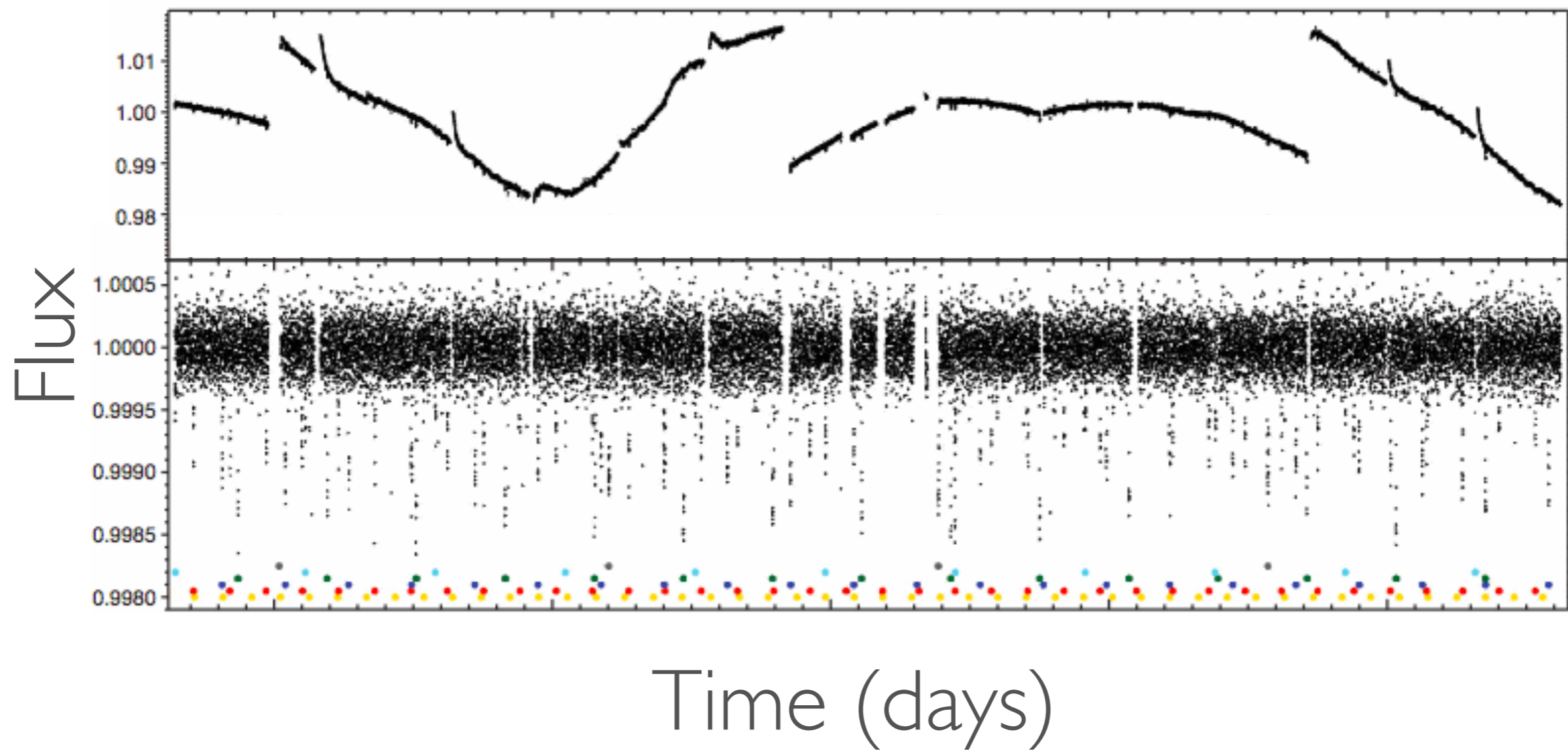


TESS

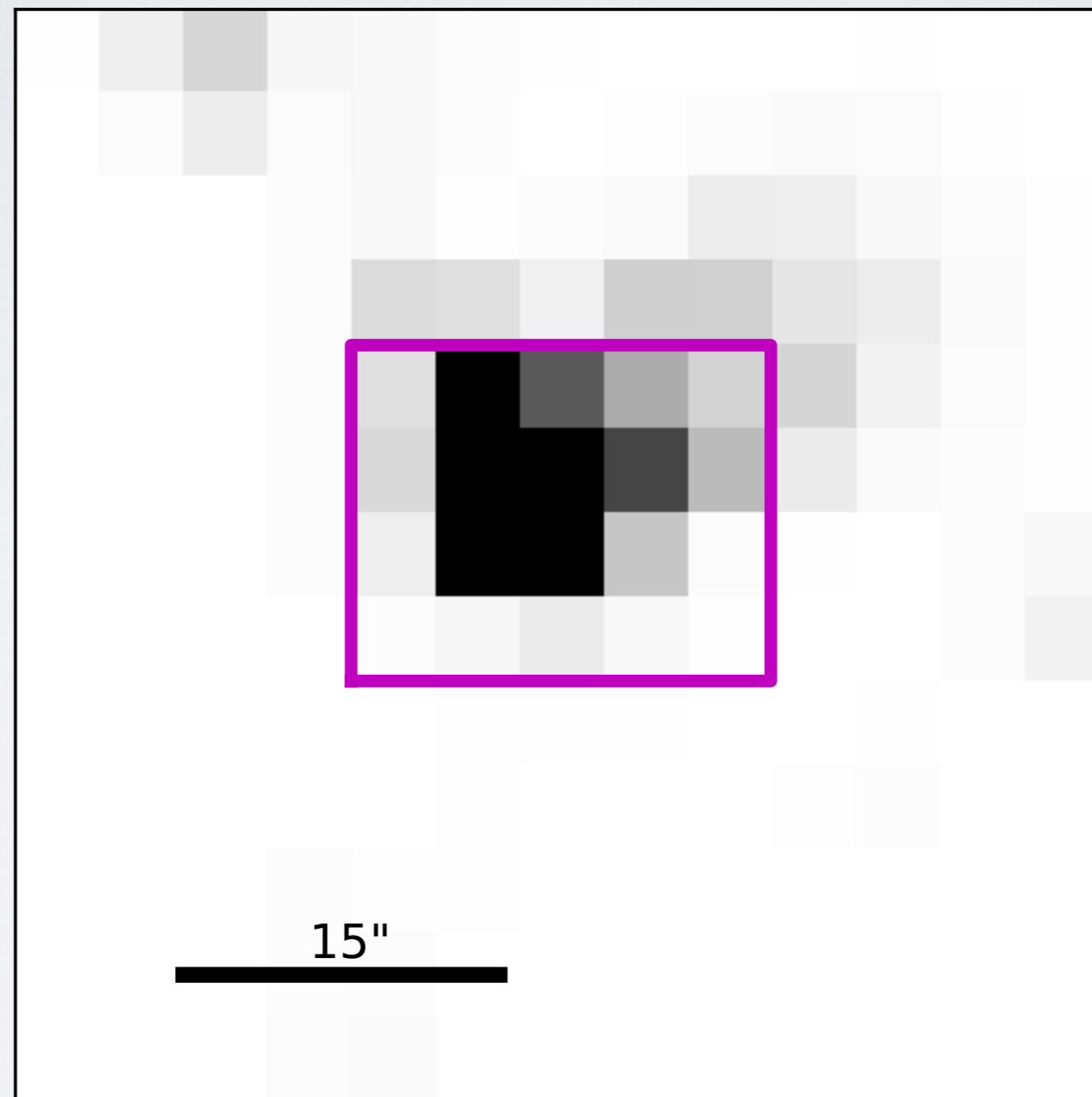
PHOTOMETRY WITH *KEPLER*

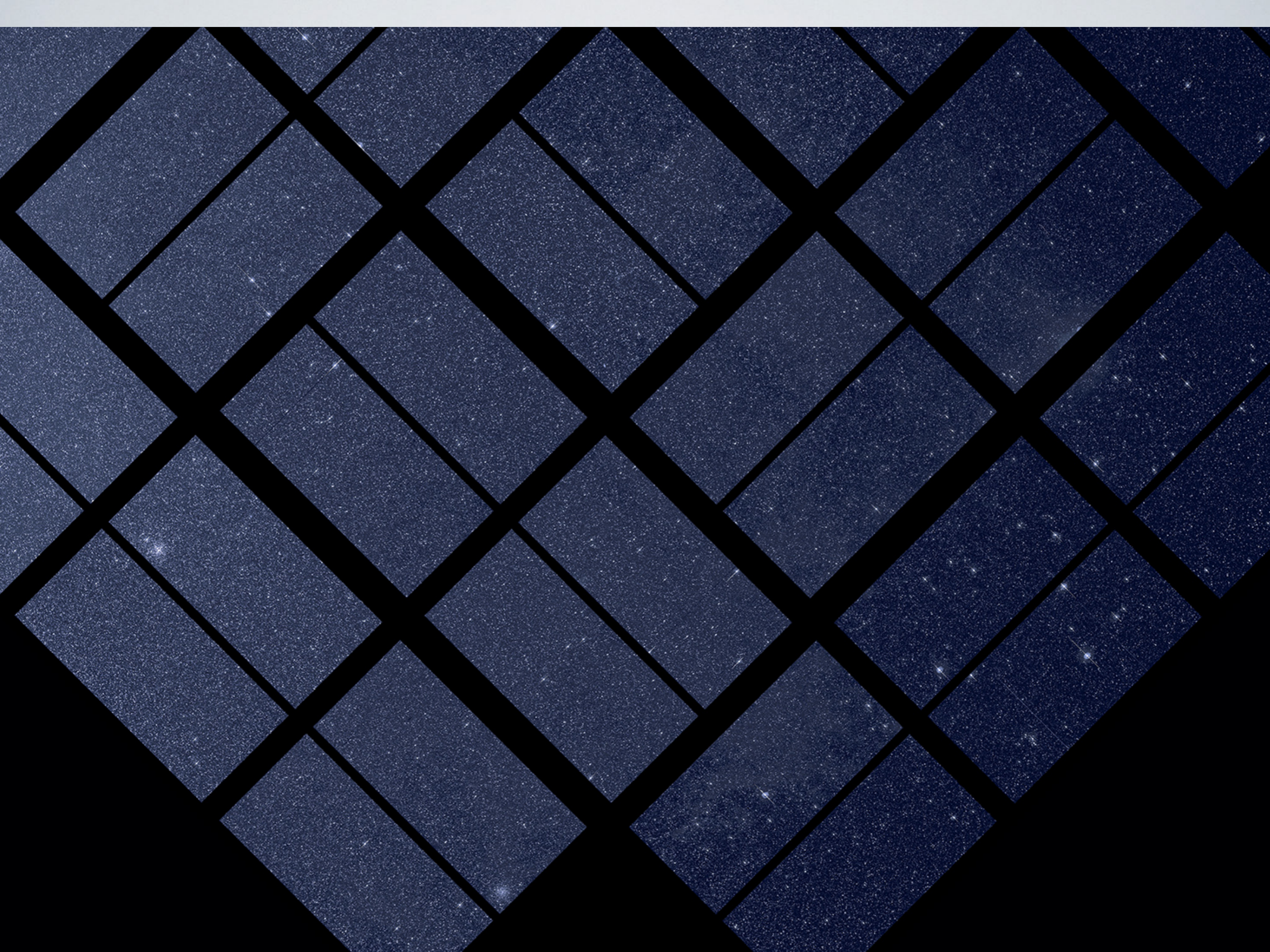


PHOTOMETRY WITH *KEPLER*



PHOTOMETRY WITH *KEPLER*





Full Frame Fotometry from the Kepler Full Frame Images Edit

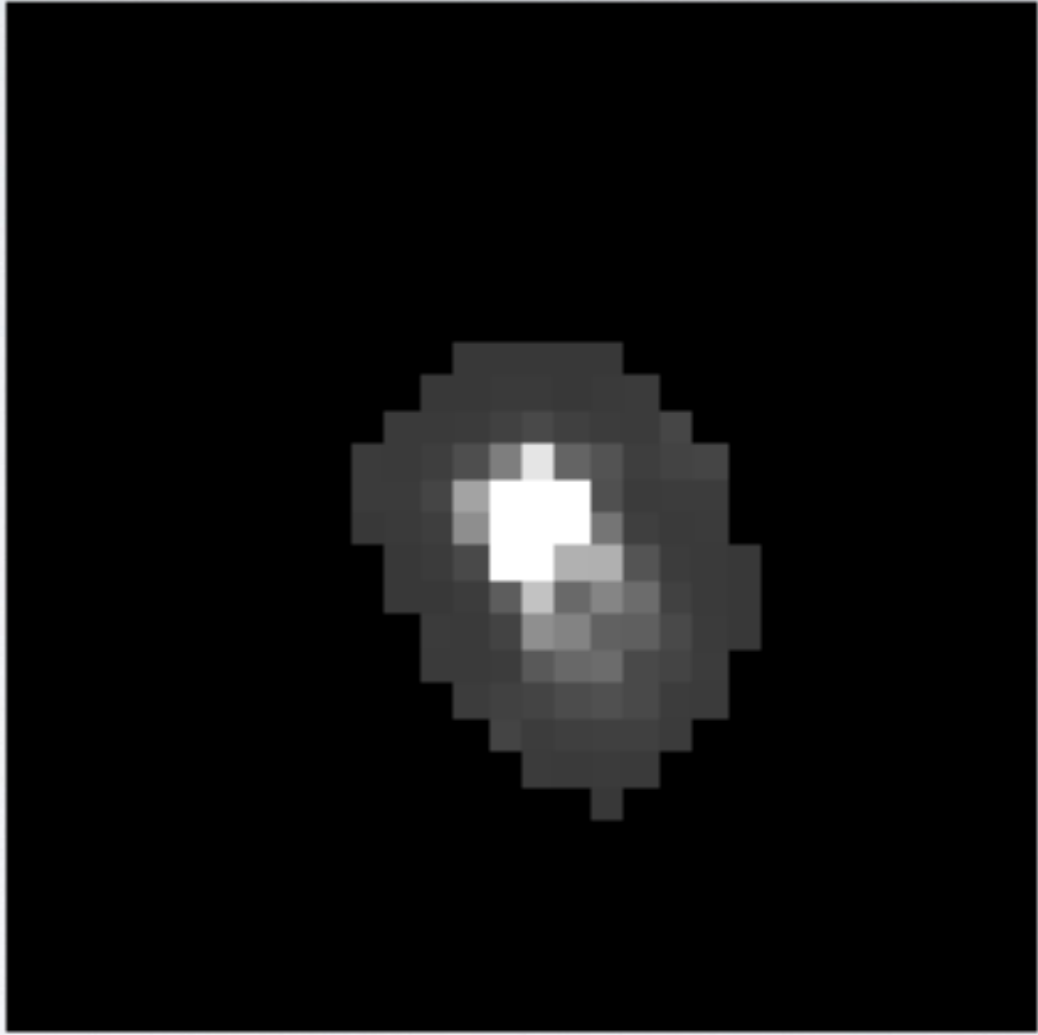
Add topics

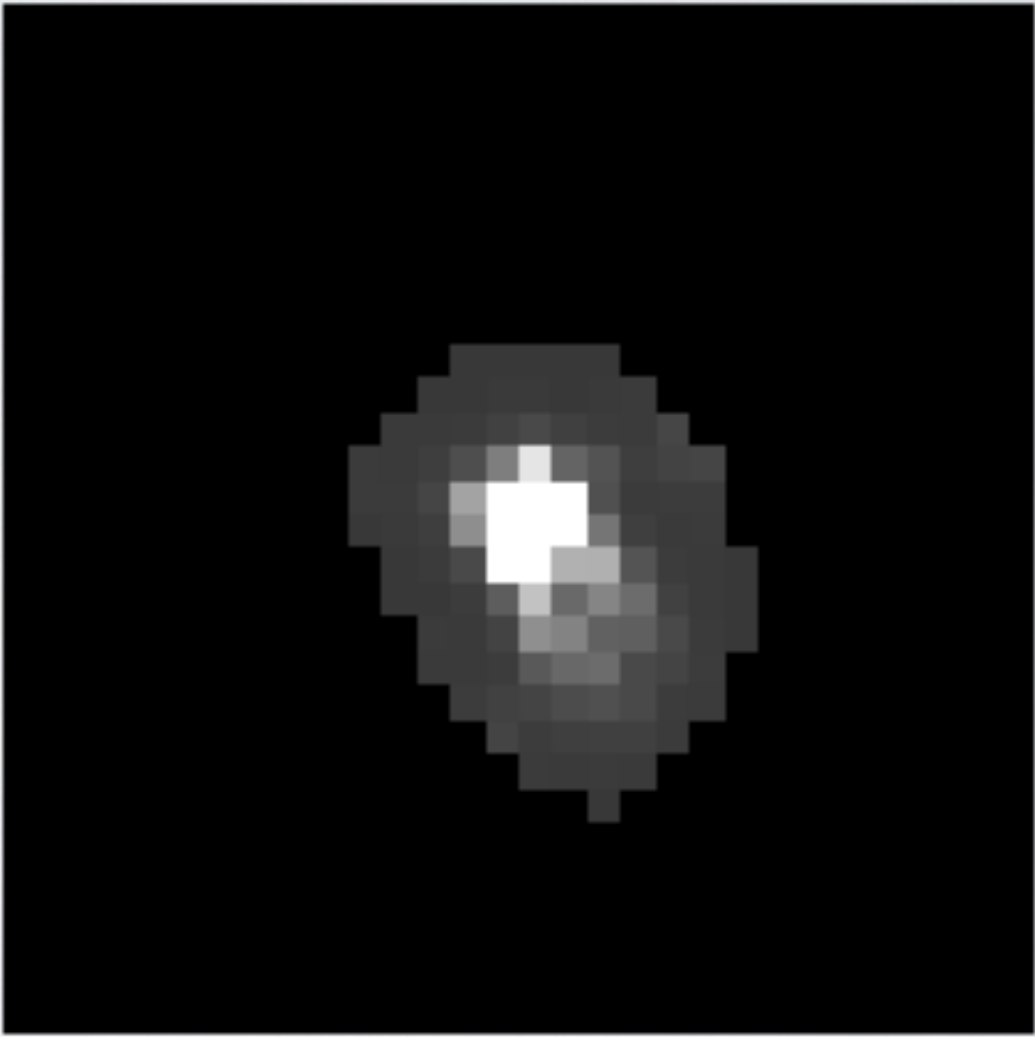
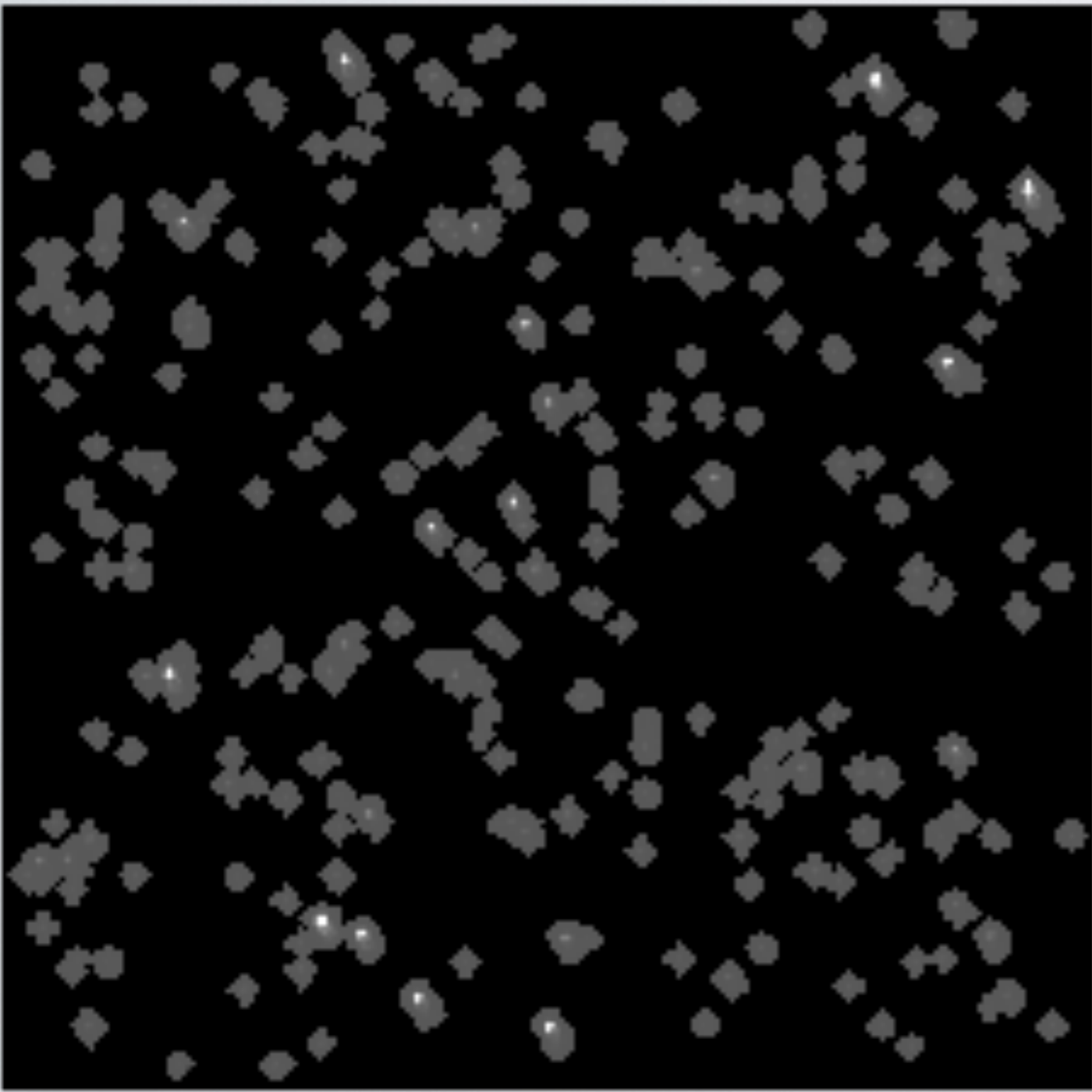
39 commits 1 branch 1 release 1 contributor MIT

Branch: master New pull request Create new file Upload files Find file Clone or download

Table with commit history: benmontet oops, forgot to increment version; docs adding uncertainty calculation from appendix; f3 squash bug in model_uncert when star falls on bad detector; LICENSE Initial commit; MANIFEST.in minor changes; README.rst adding docs and paper bibtex entry to readme; demo.ipynb adding note in demo; obs_info.txt squashing minor bug; setup.py oops, forgot to increment version







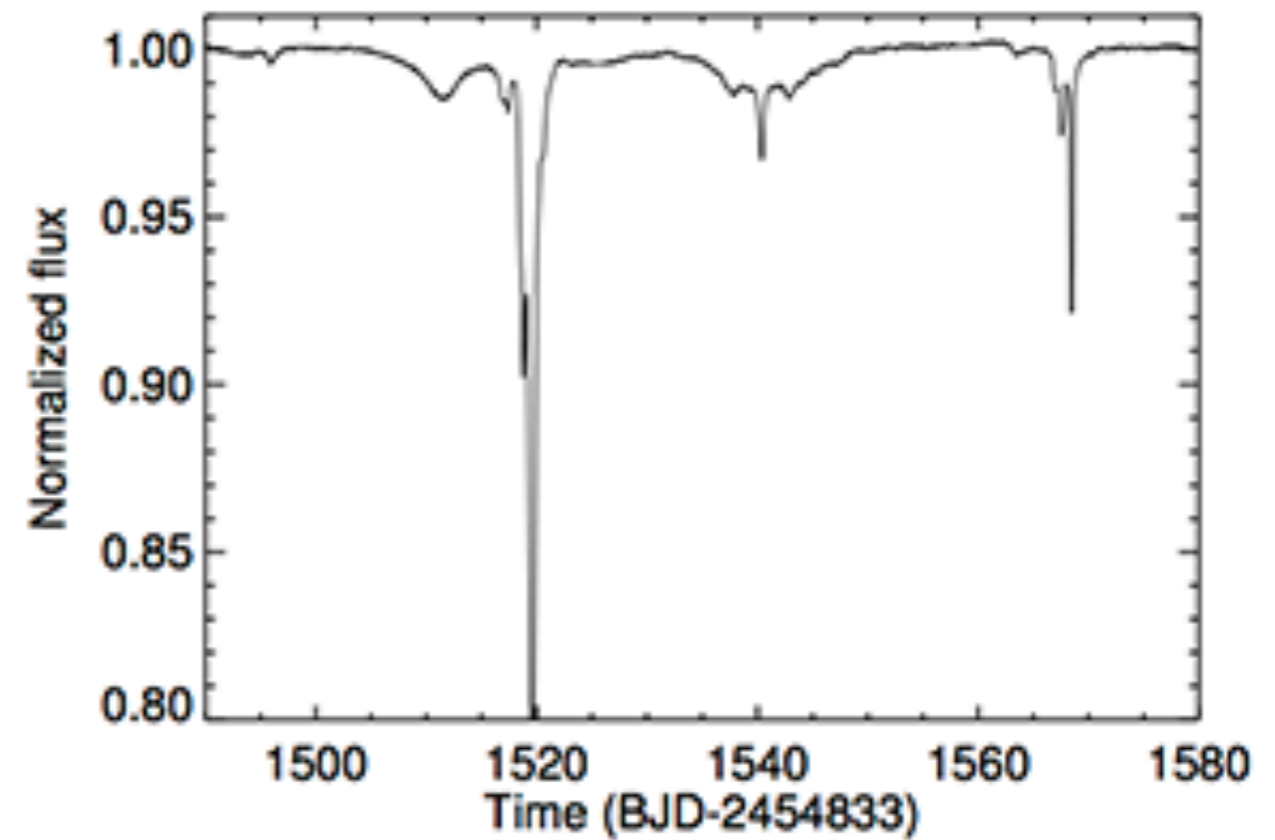
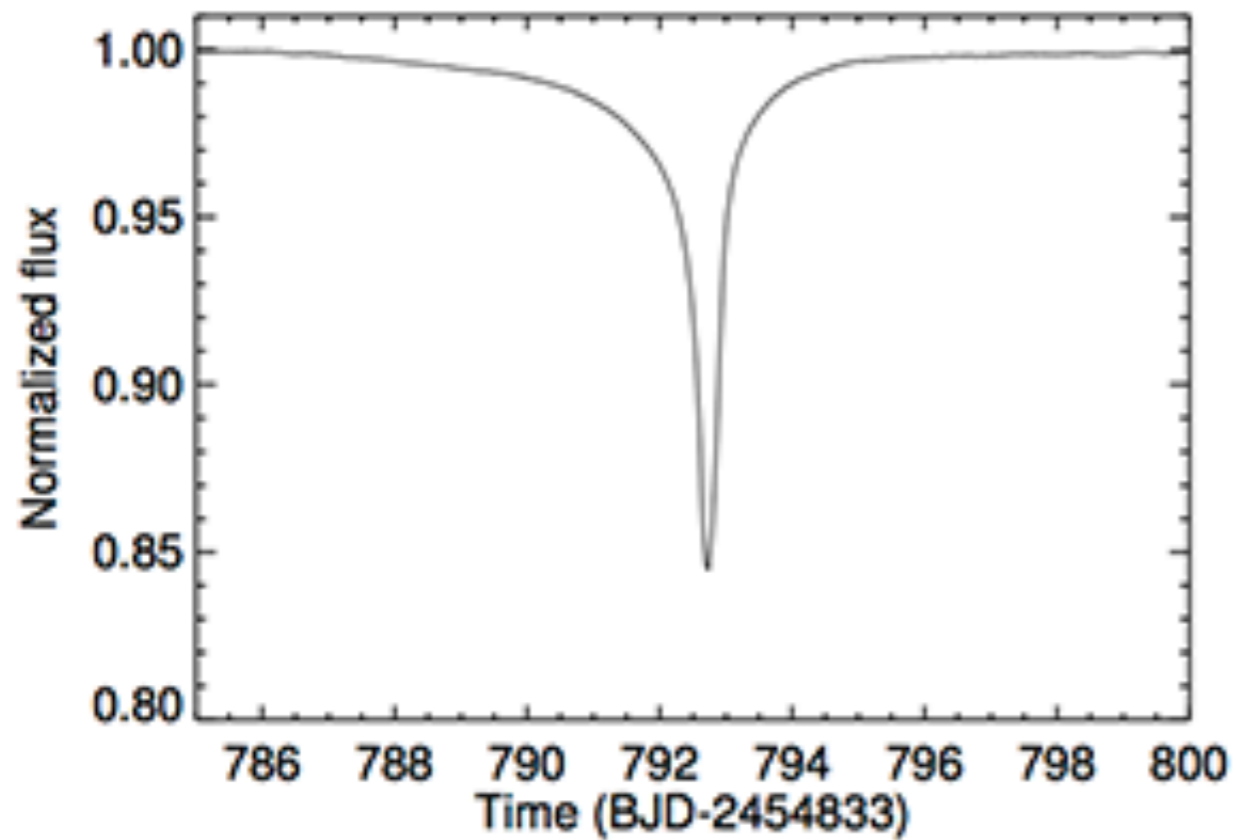
KIC 8462852

KIC 8462852

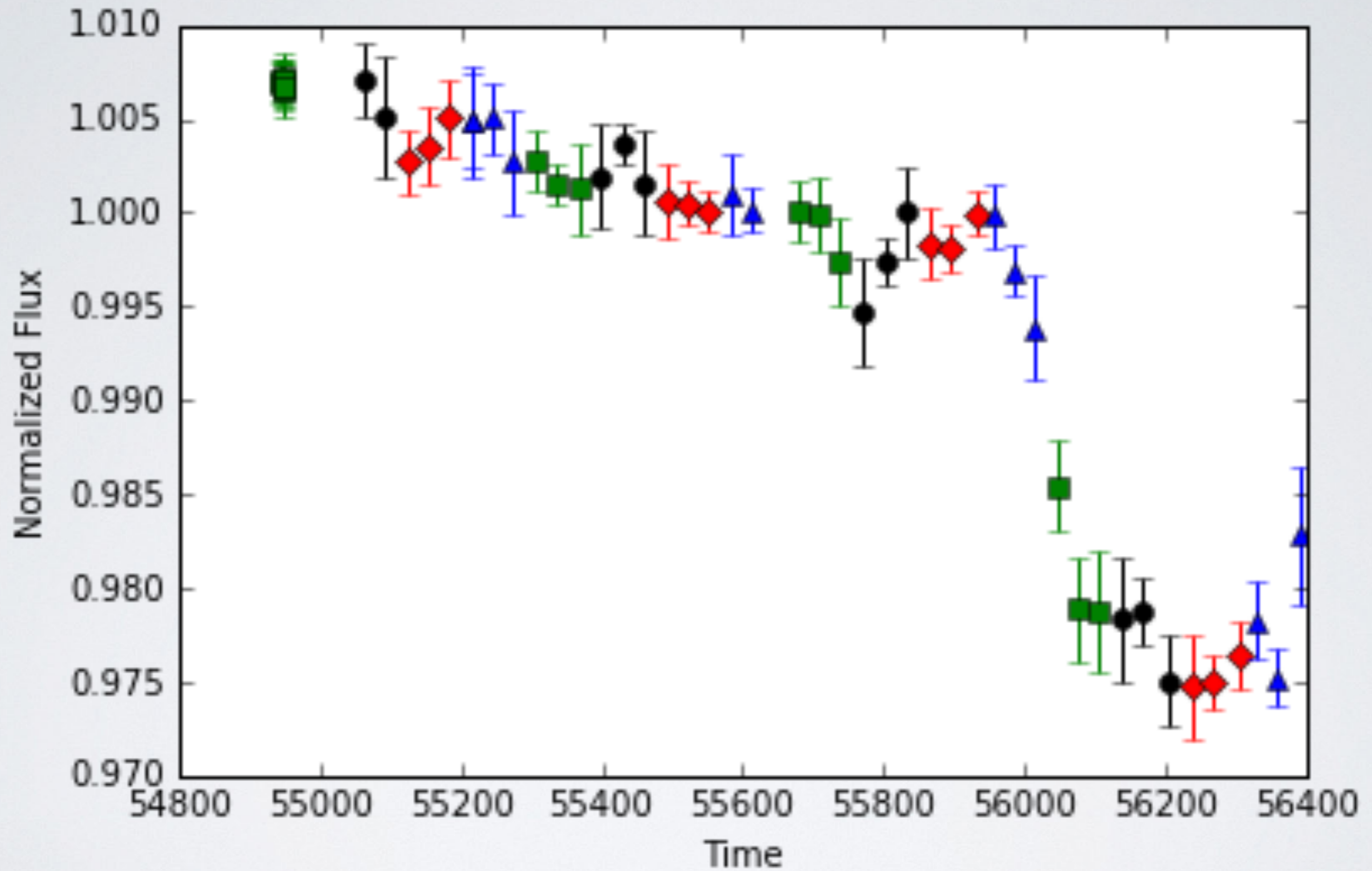


The Herald Sun (Australia)

KIC 8462852

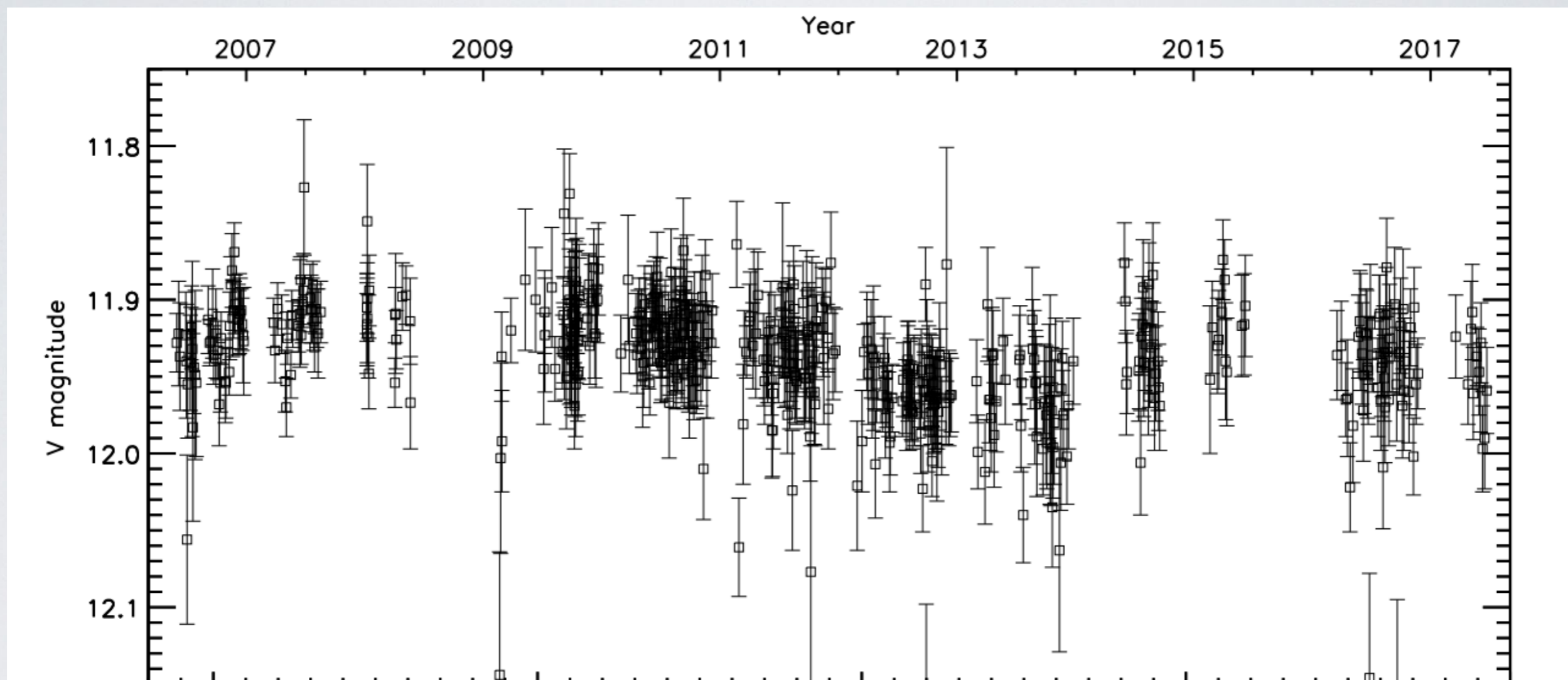


KIC 8462852



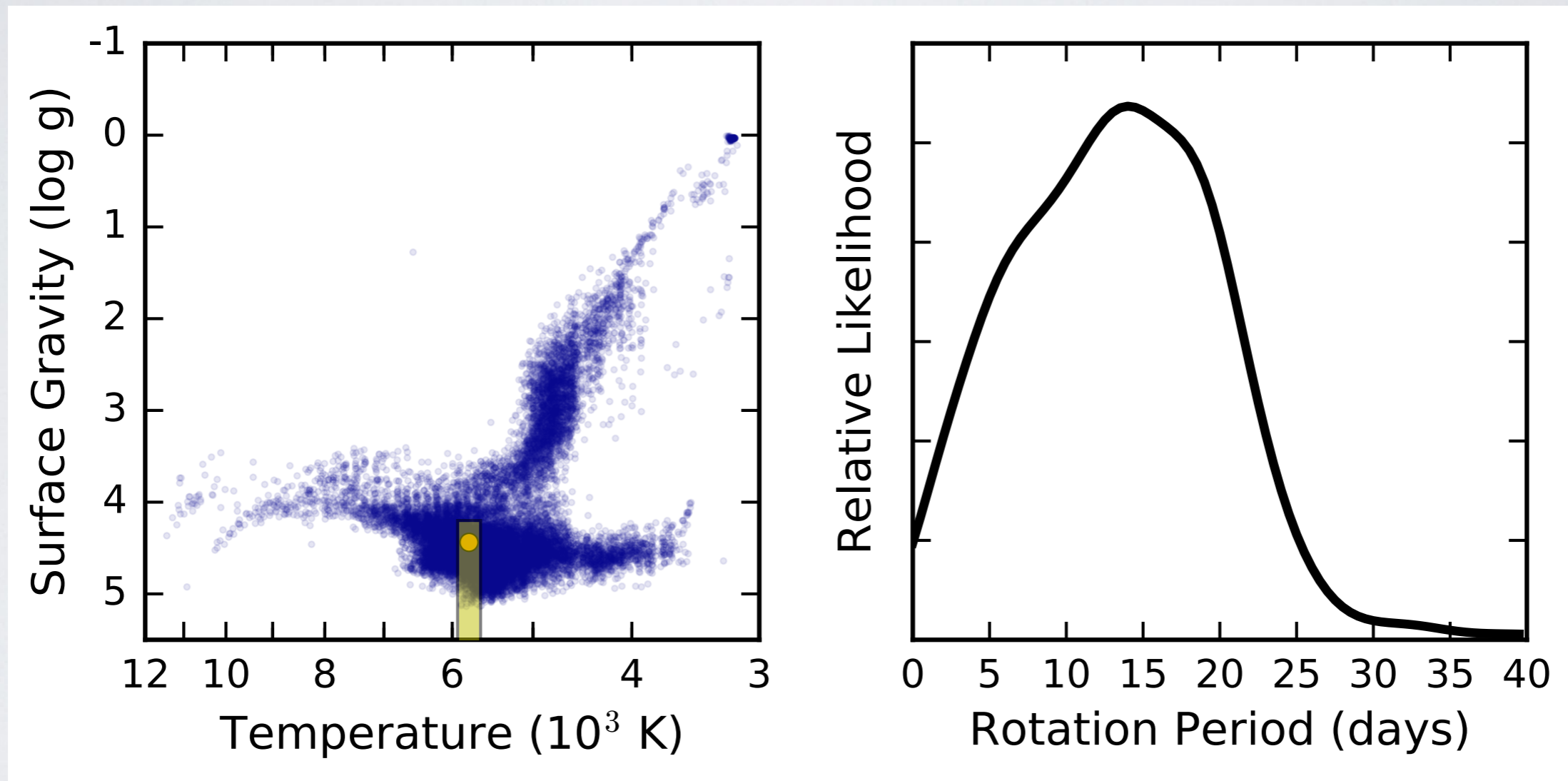
Montet and Simon (2016)

GROUND-BASED DATA CORROBORATE OBSERVATIONS

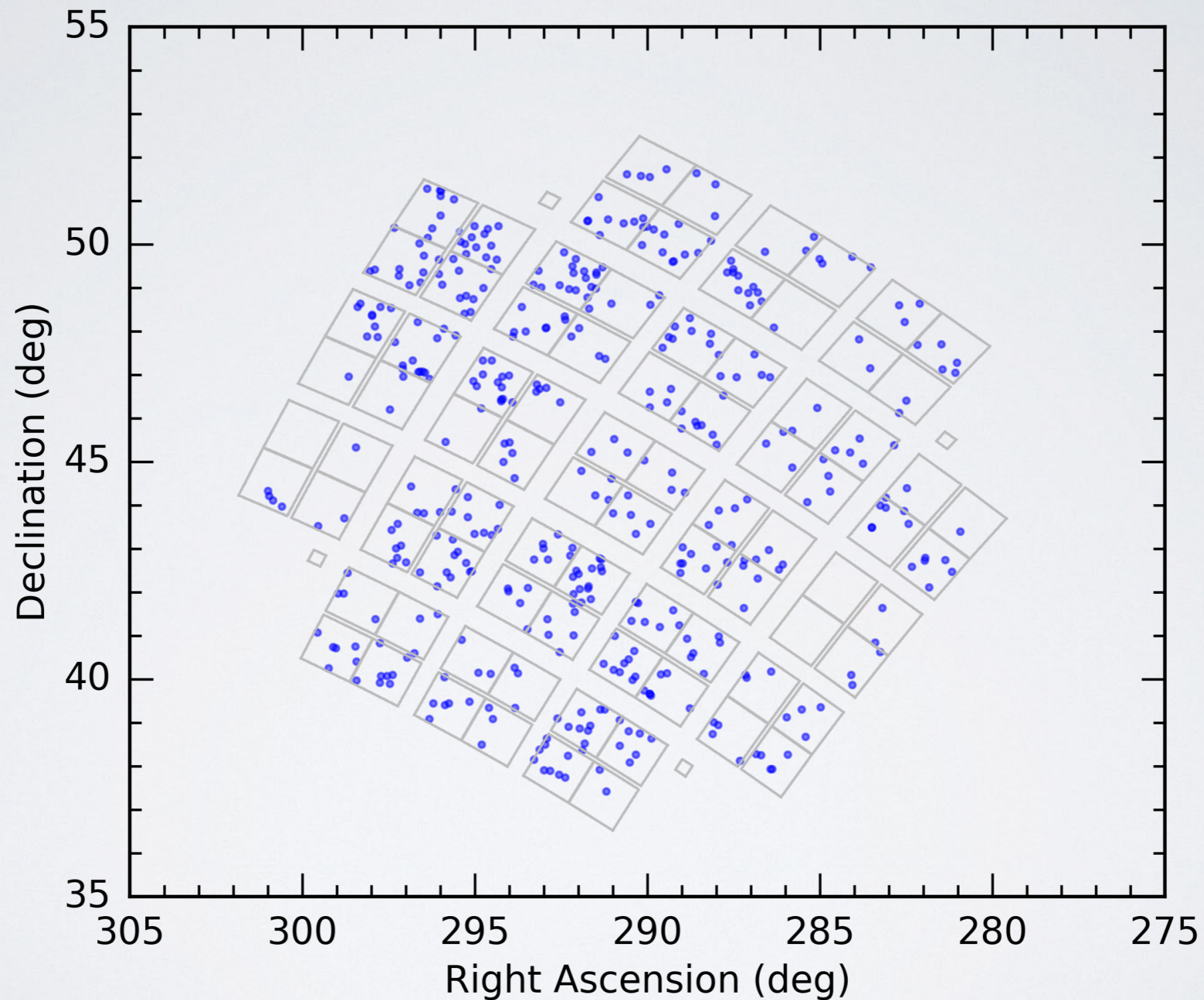


Simon et al. 2017, see also Davenport et al. 2017

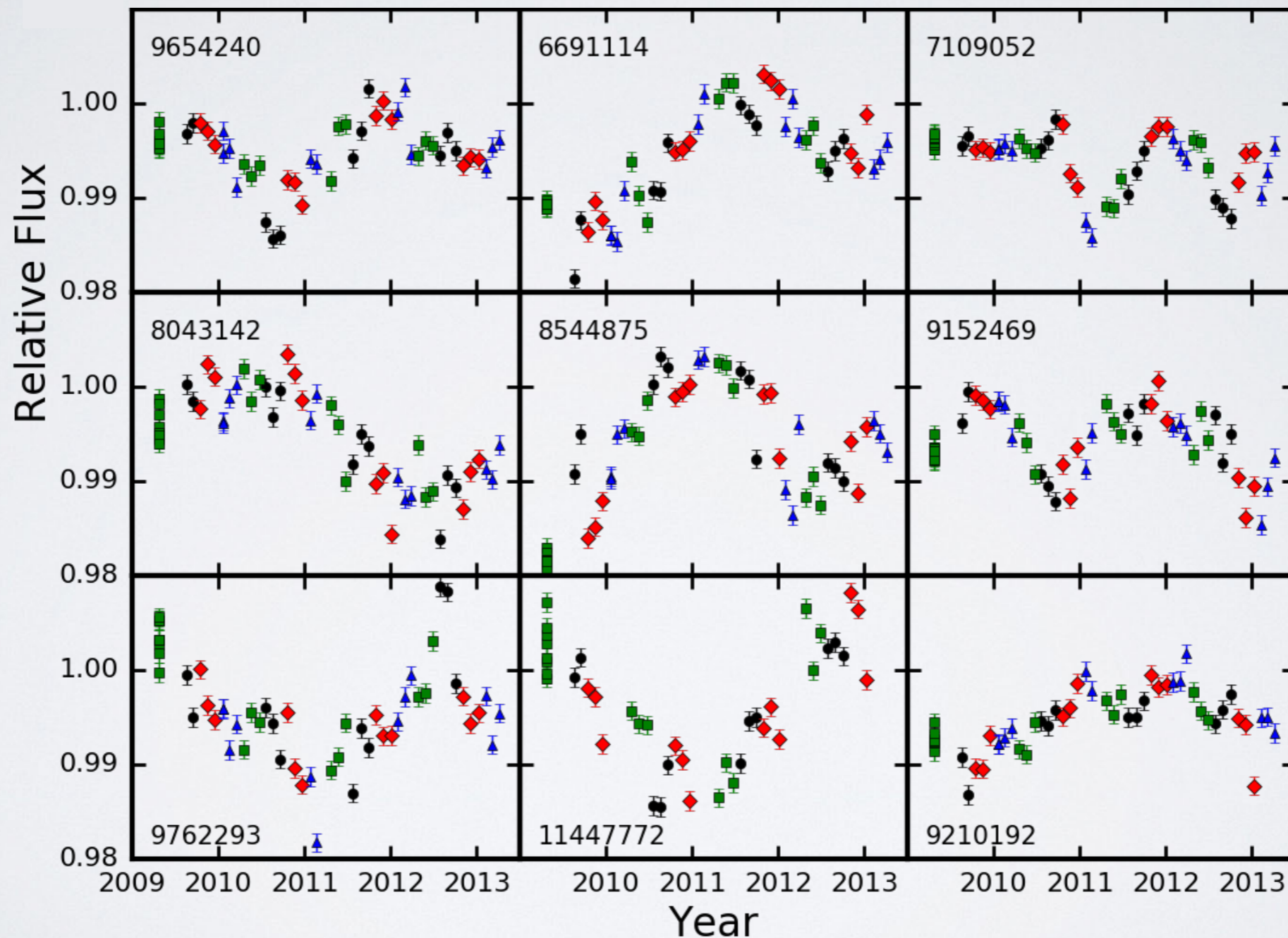
KEPLER OBSERVED THOUSANDS OF SUN-LIKE STARS



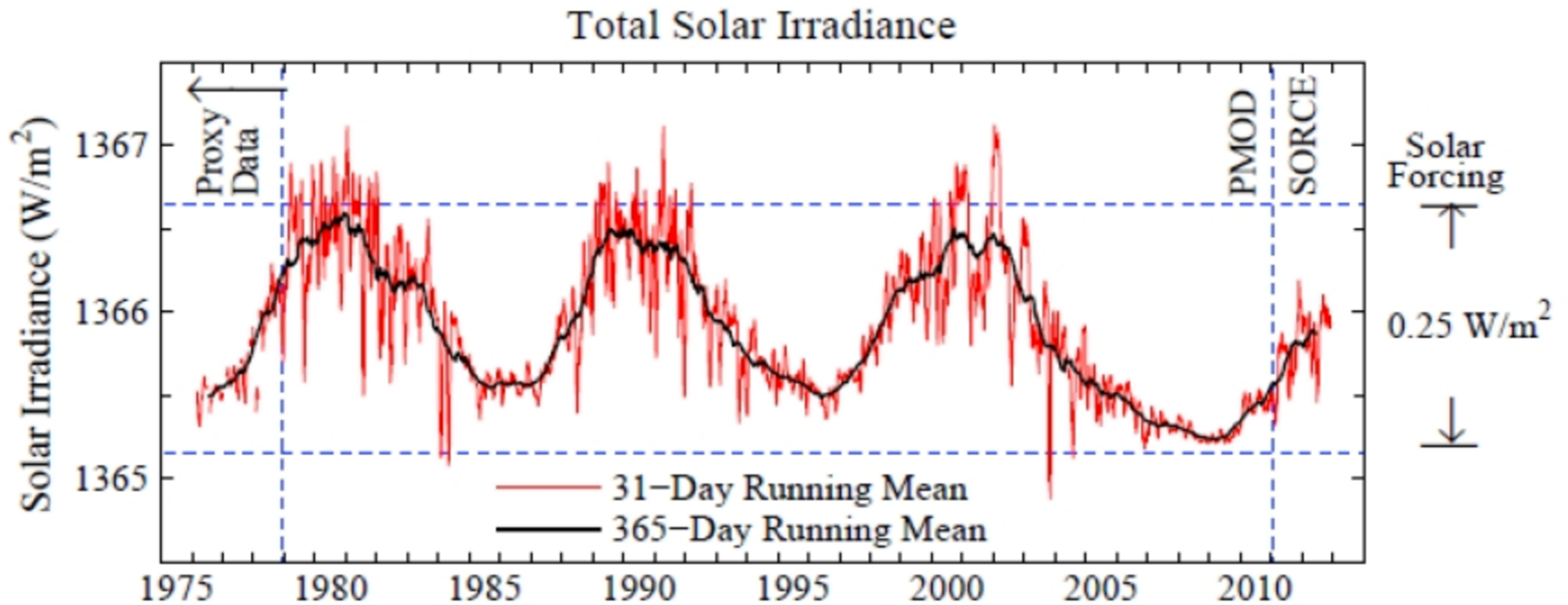
VARIABLE SUN-LIKE STARS



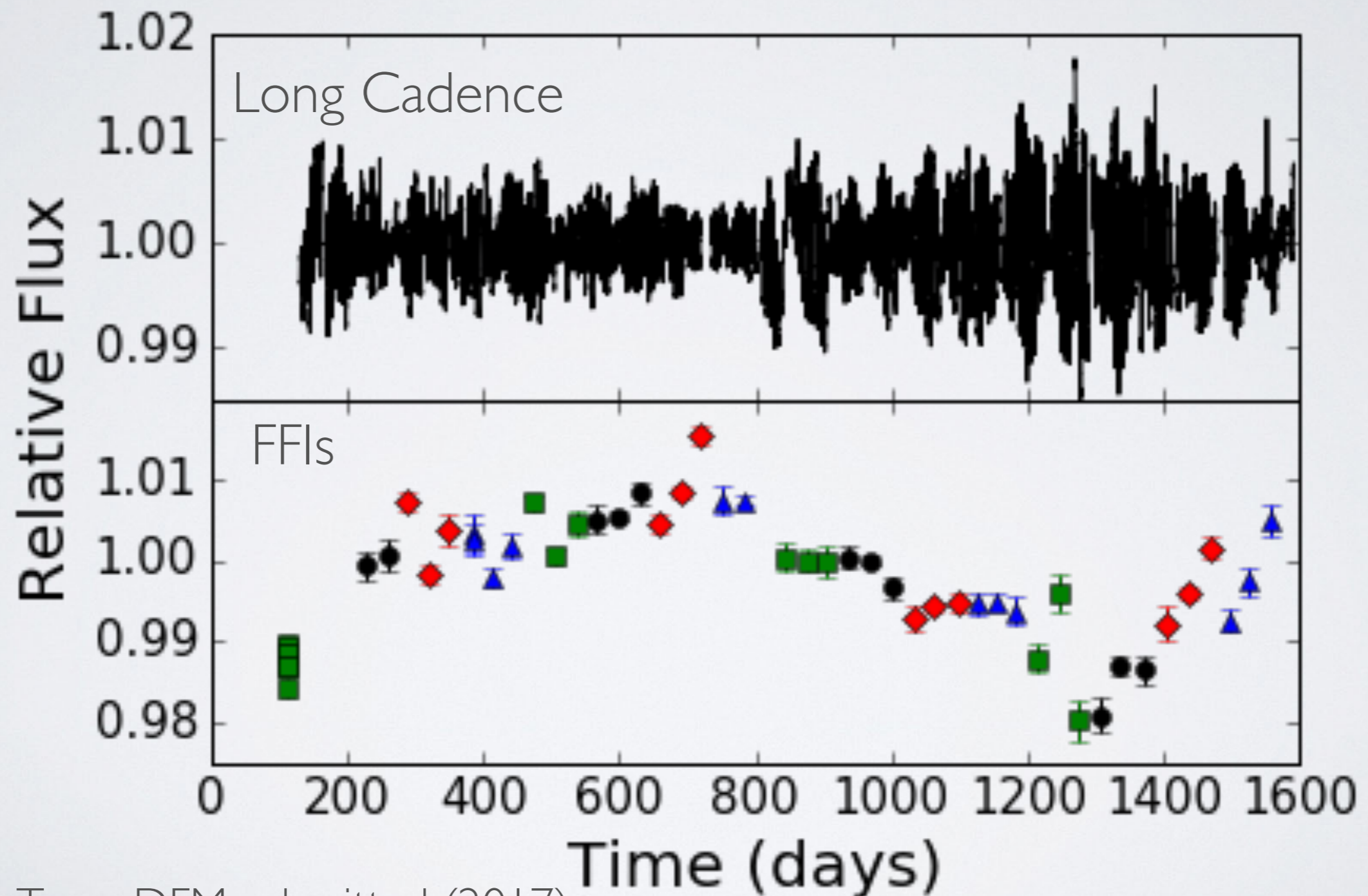
WE DETECT VARIABLE BEHAVIOR



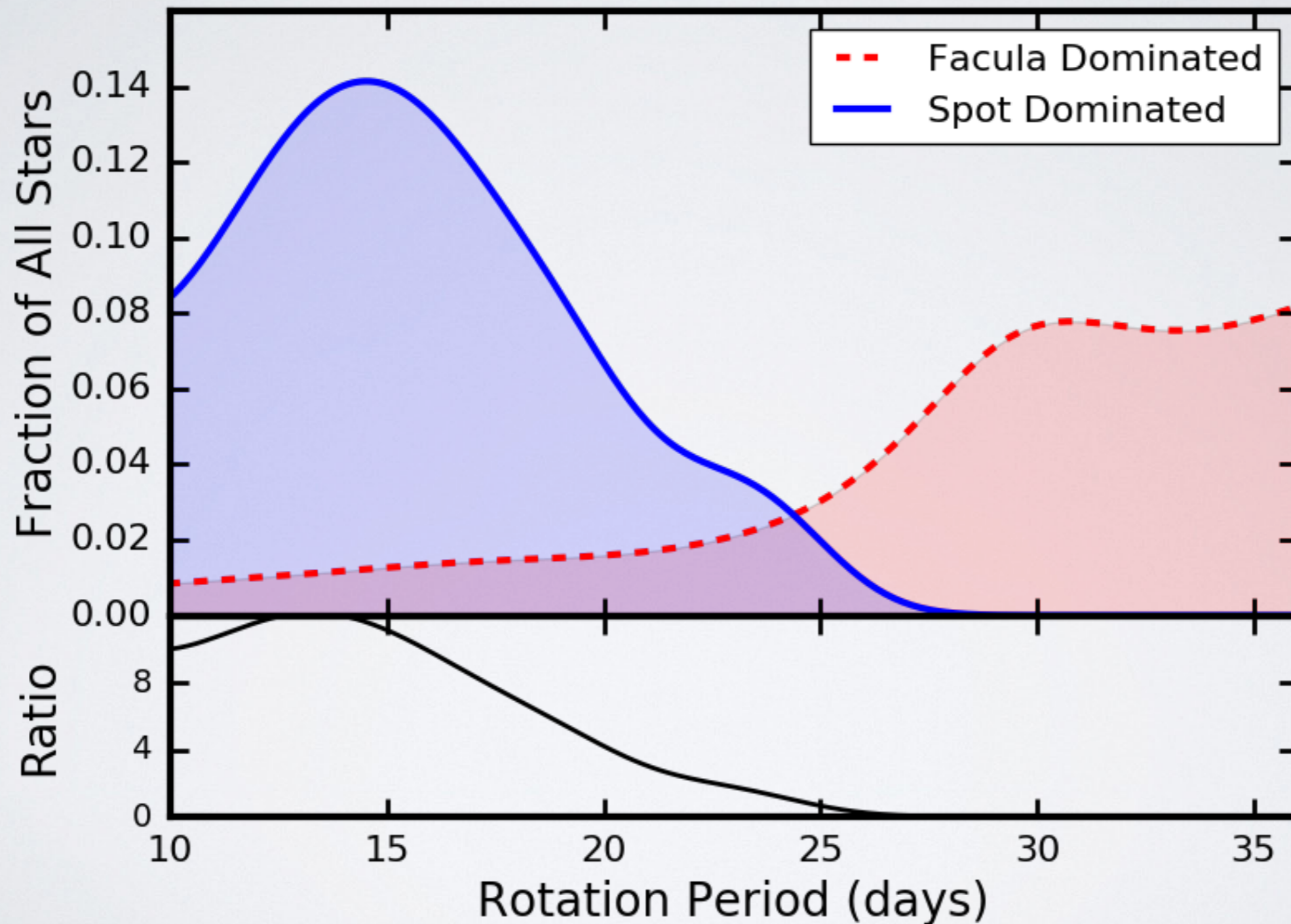
STELLAR ACTIVITY VIA PHOTOMETRY



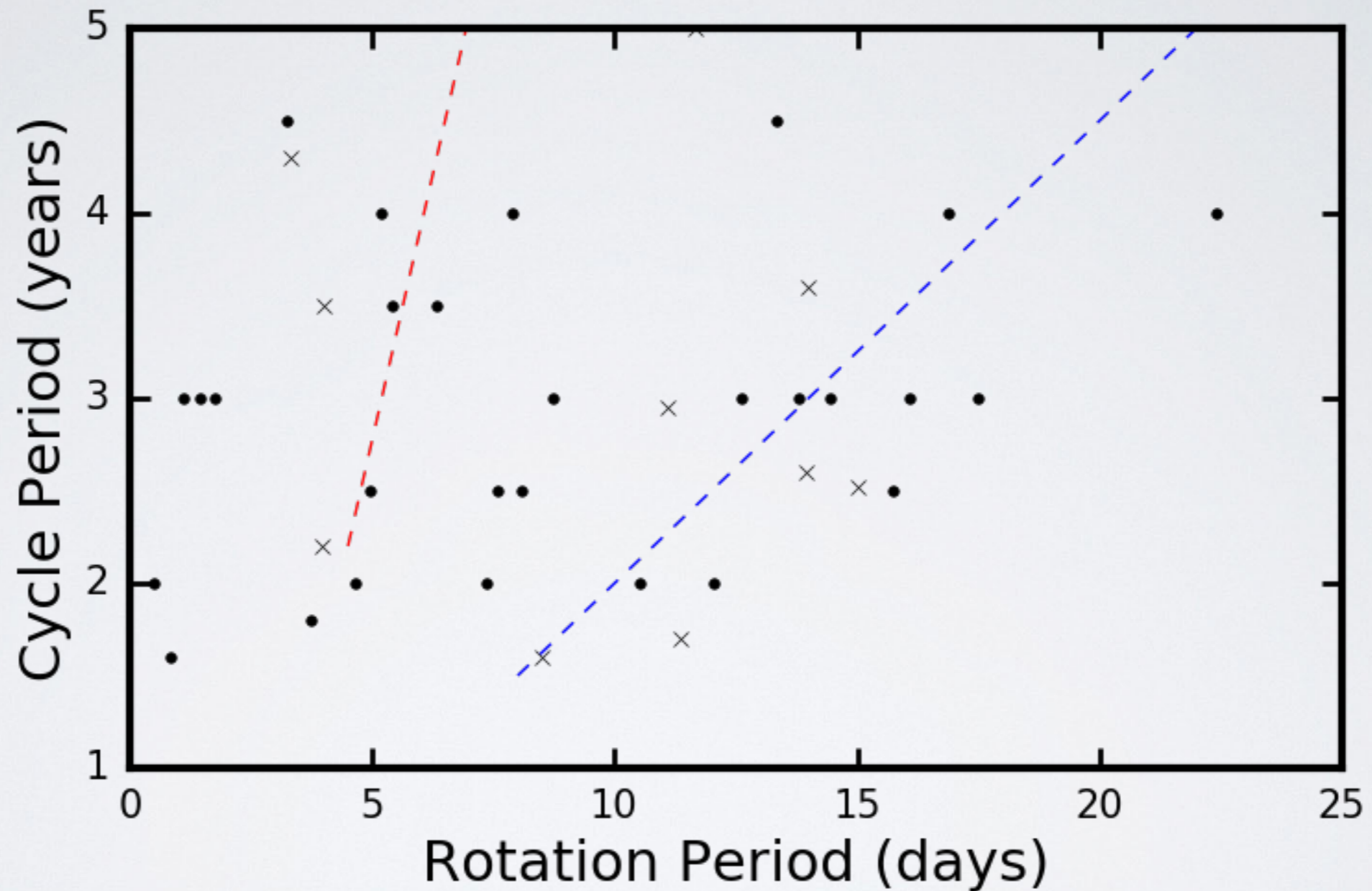
COMPARING LONG-TERM VARIABILITY TO SPOTS

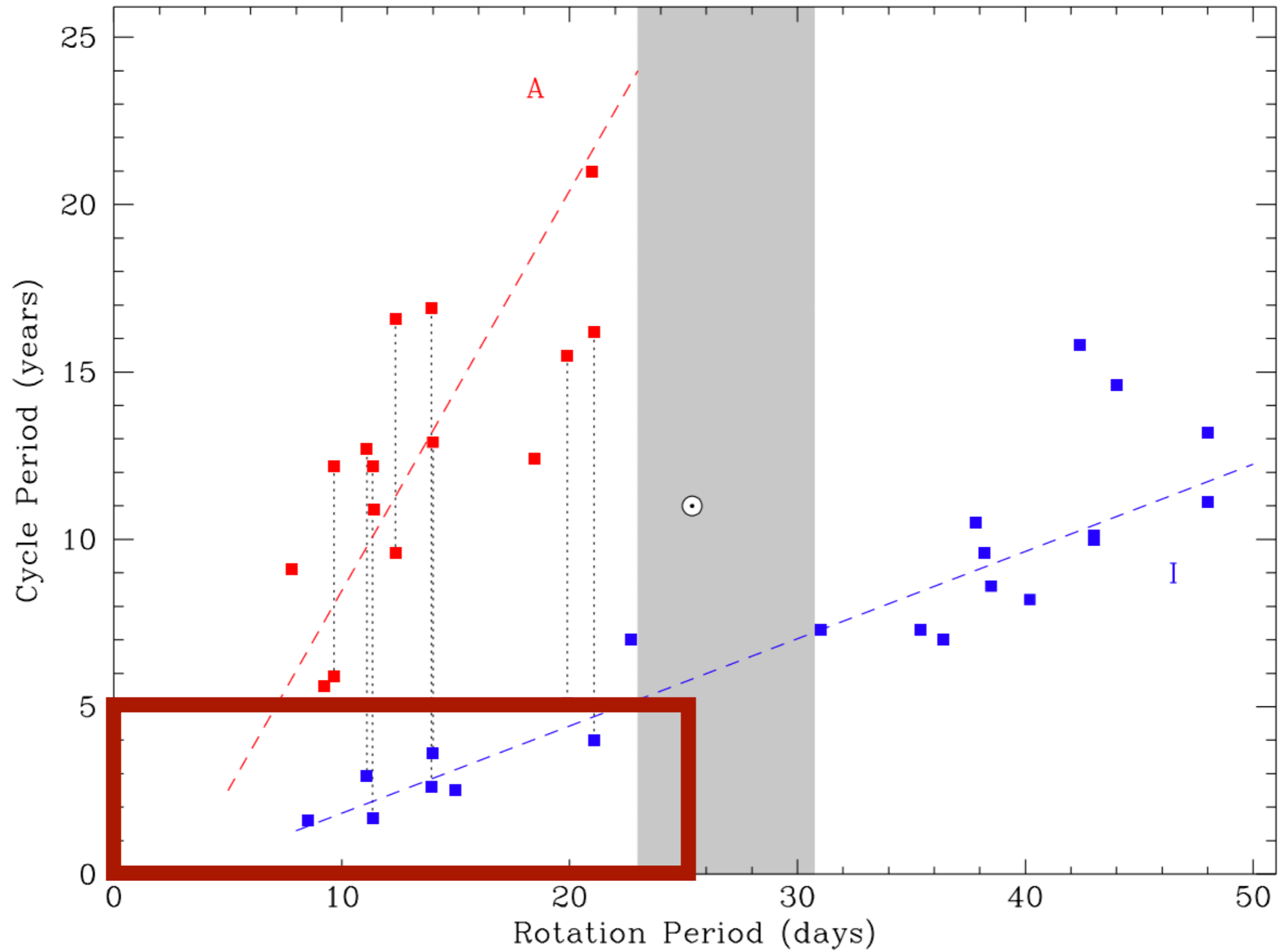


RAPID AND SLOW ROTATORS BEHAVE DIFFERENTLY



STARS WITH COMPLETE CYCLES?

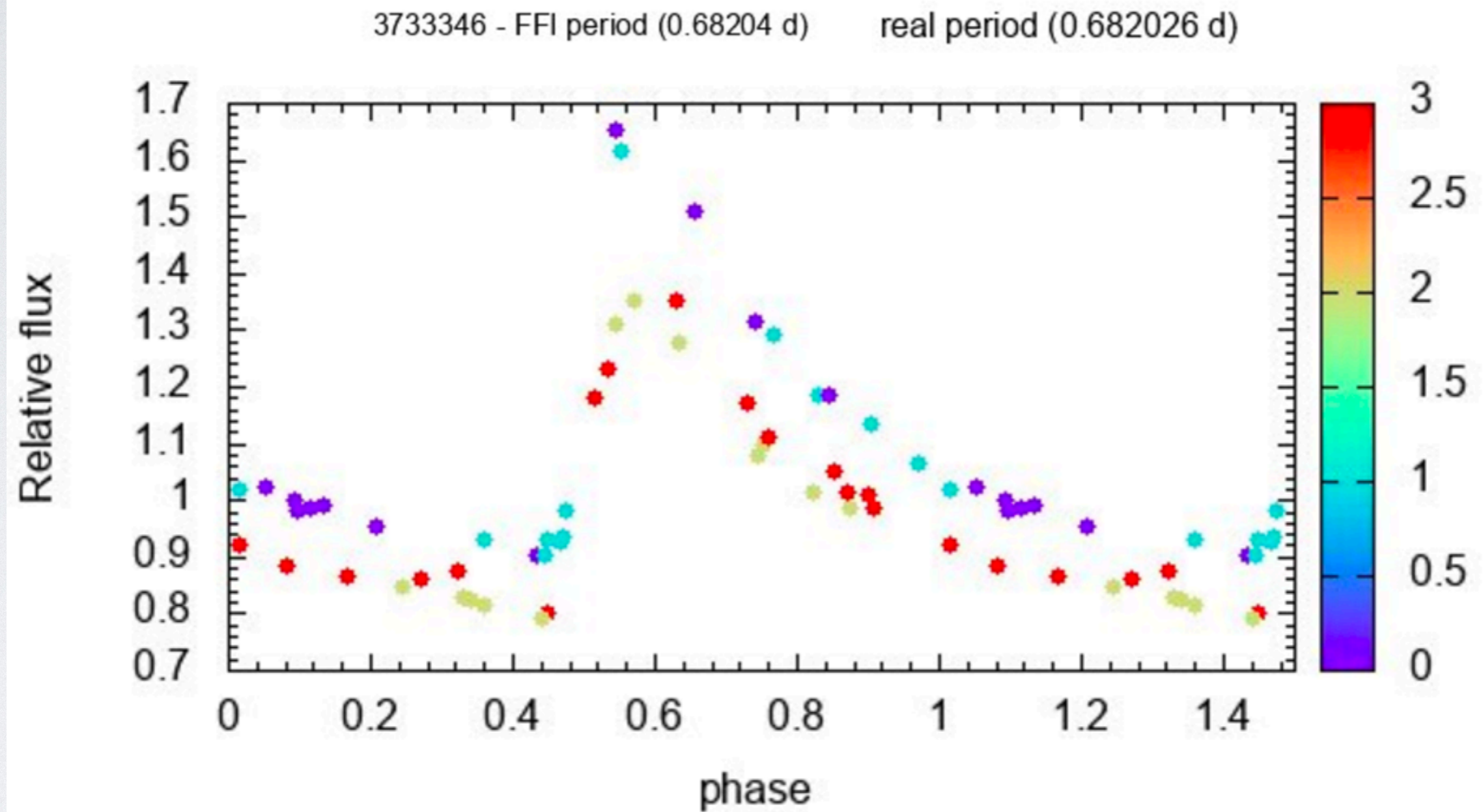




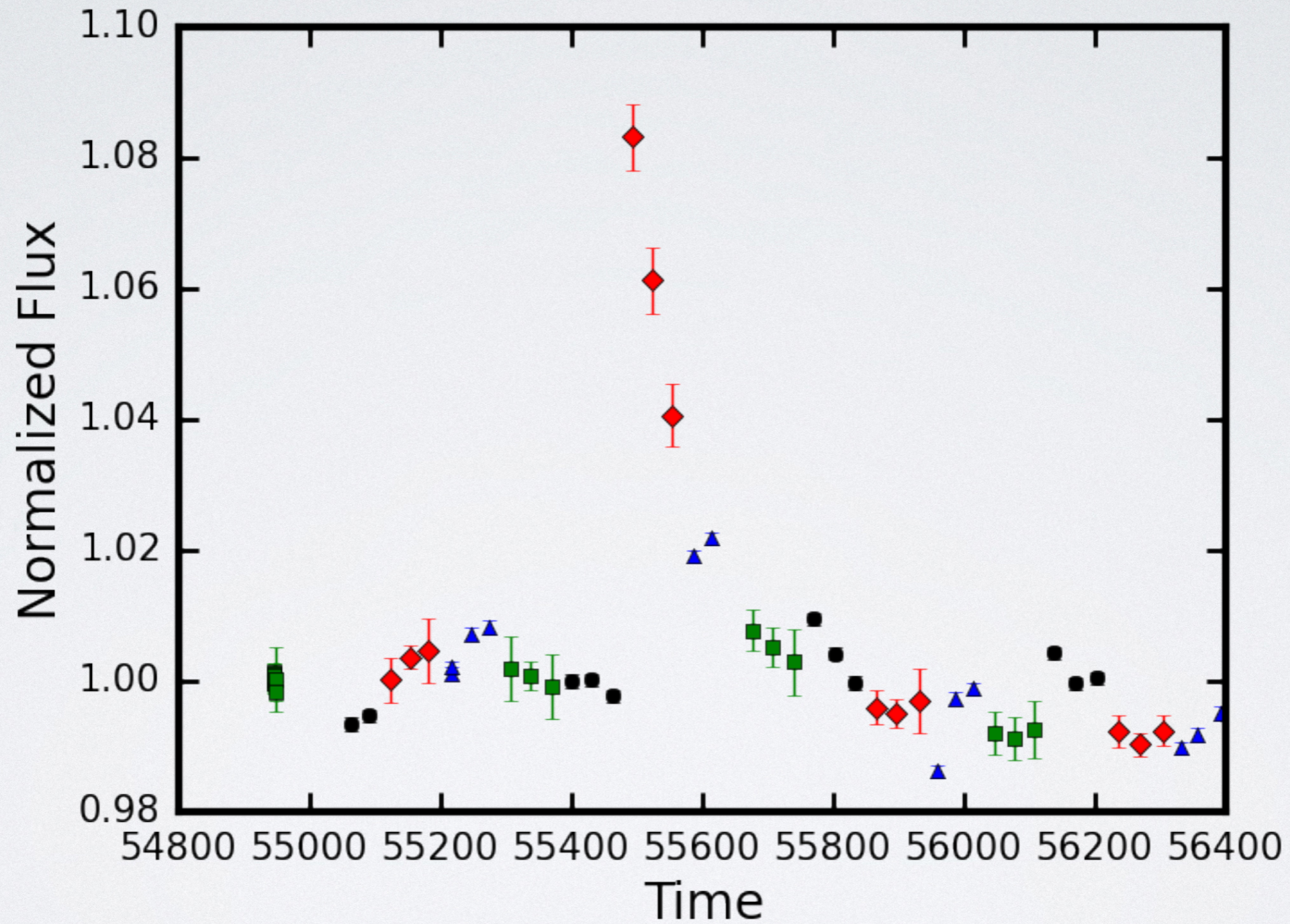
Metcalfe et al. (2016)

We need more data!

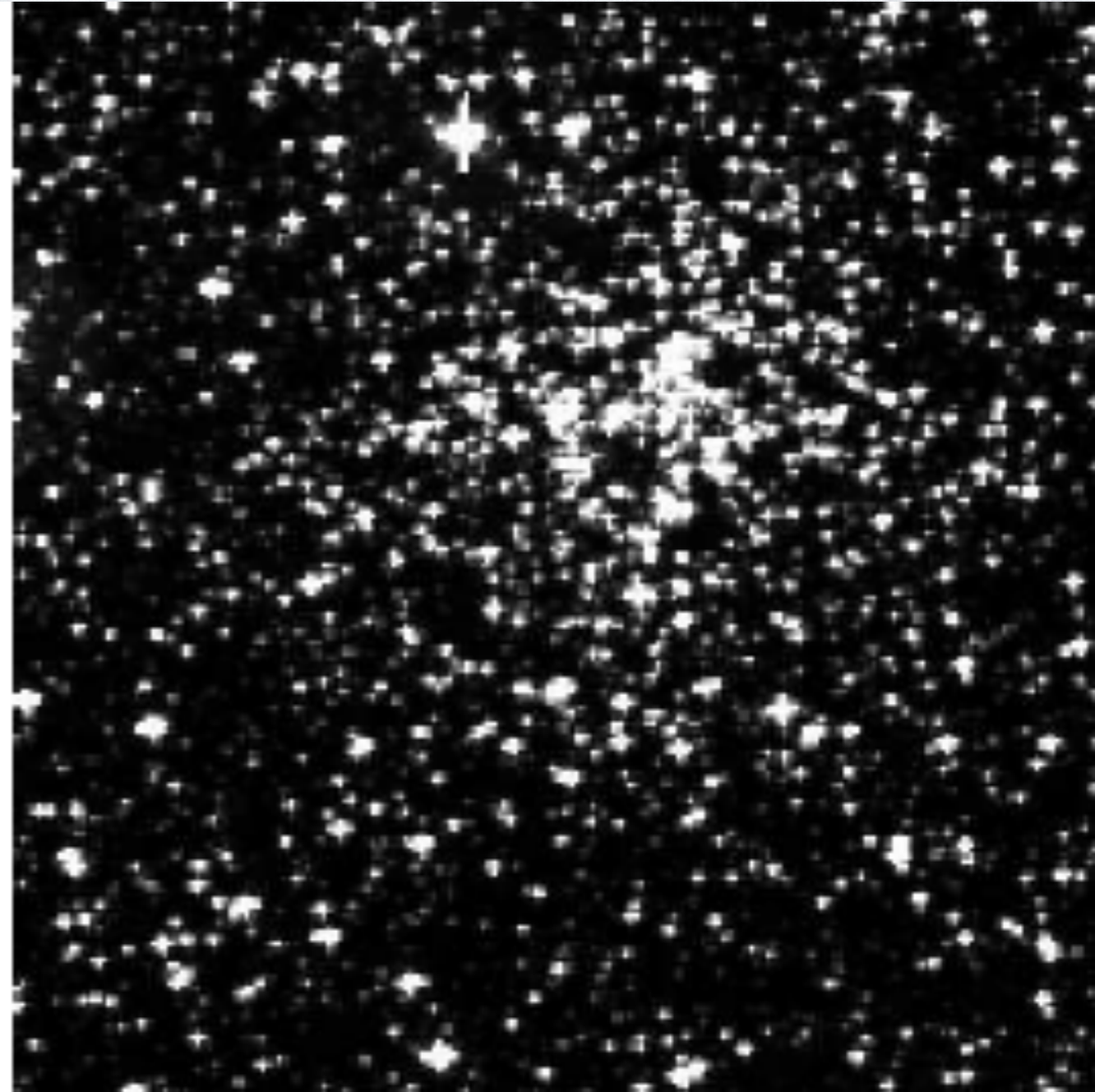
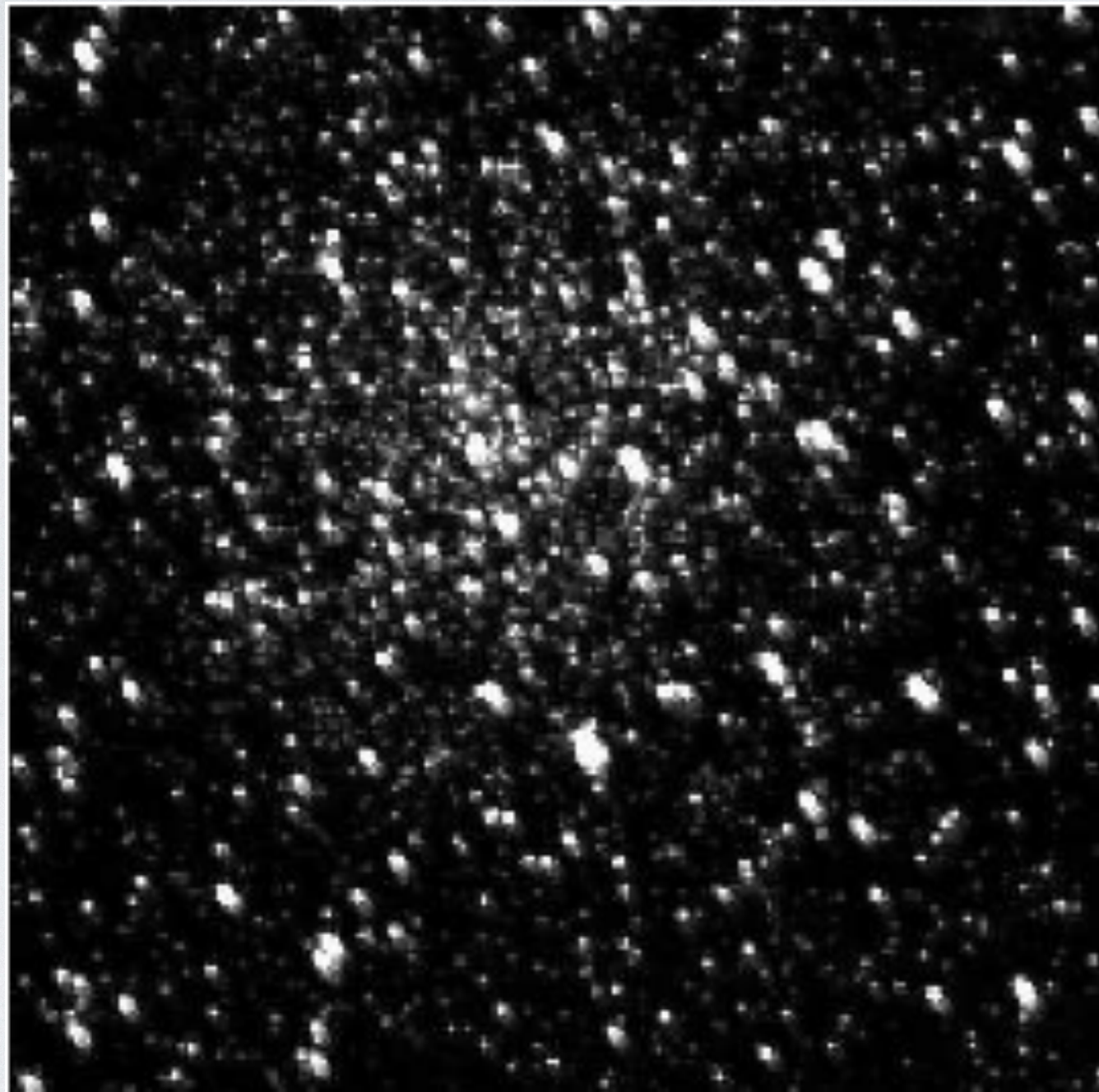
FFI RR LYRAES!



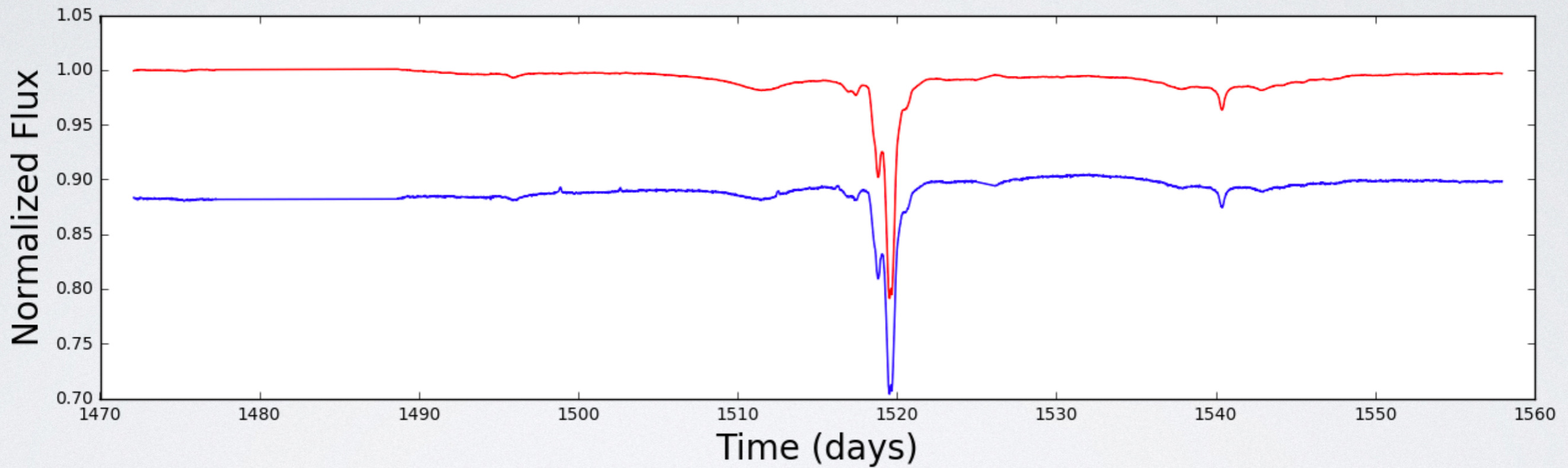
SLOW SUPERNOVAE



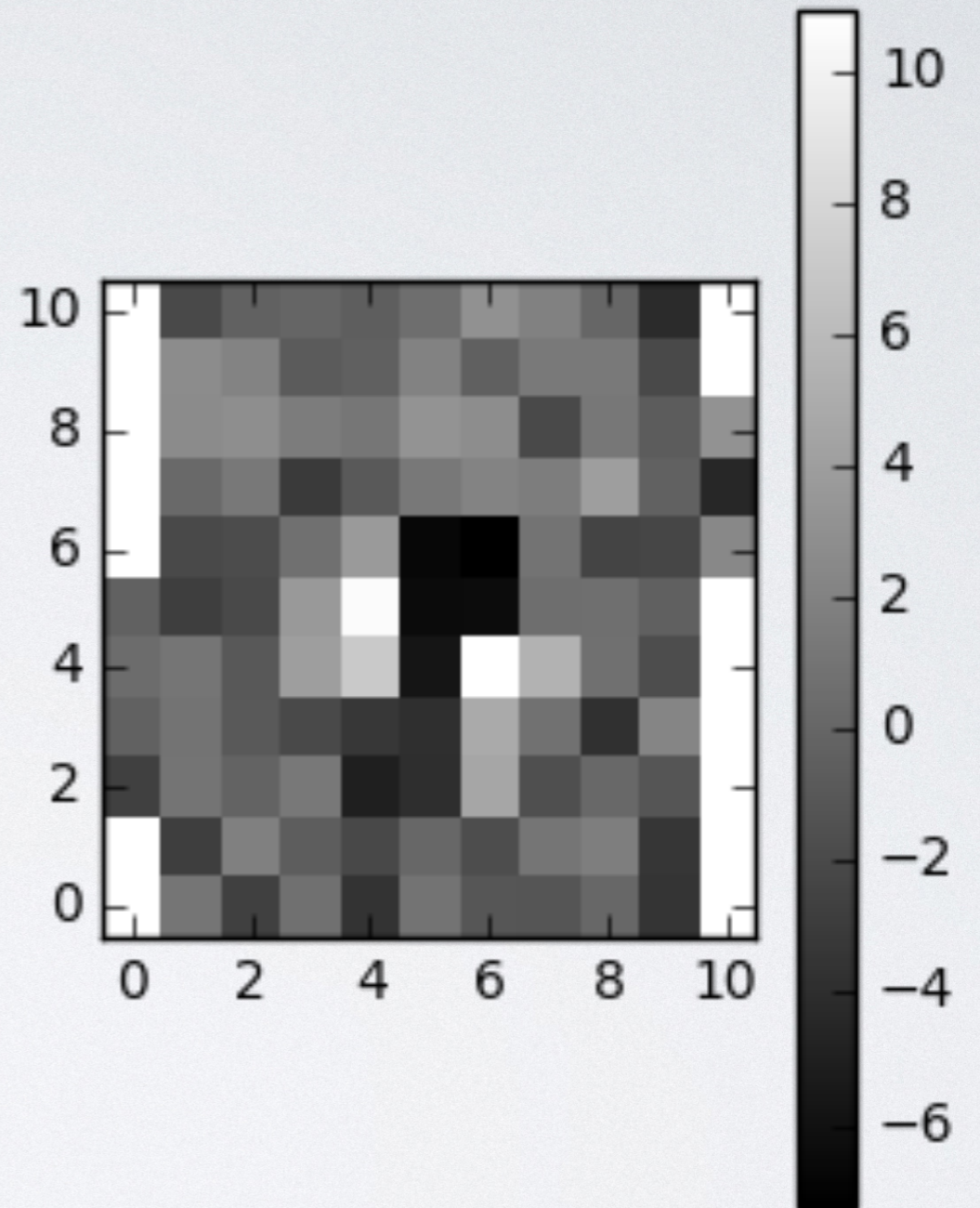
THE FUTURE



PSF MODELELED LIGHT CURVES!



KEPLER
IS **STABLE!**
THIS PROVIDES
AN
OPPORTUNITY



WITH MANY STARS, WE CAN
DEVELOP A

QUALITY PSF MODEL

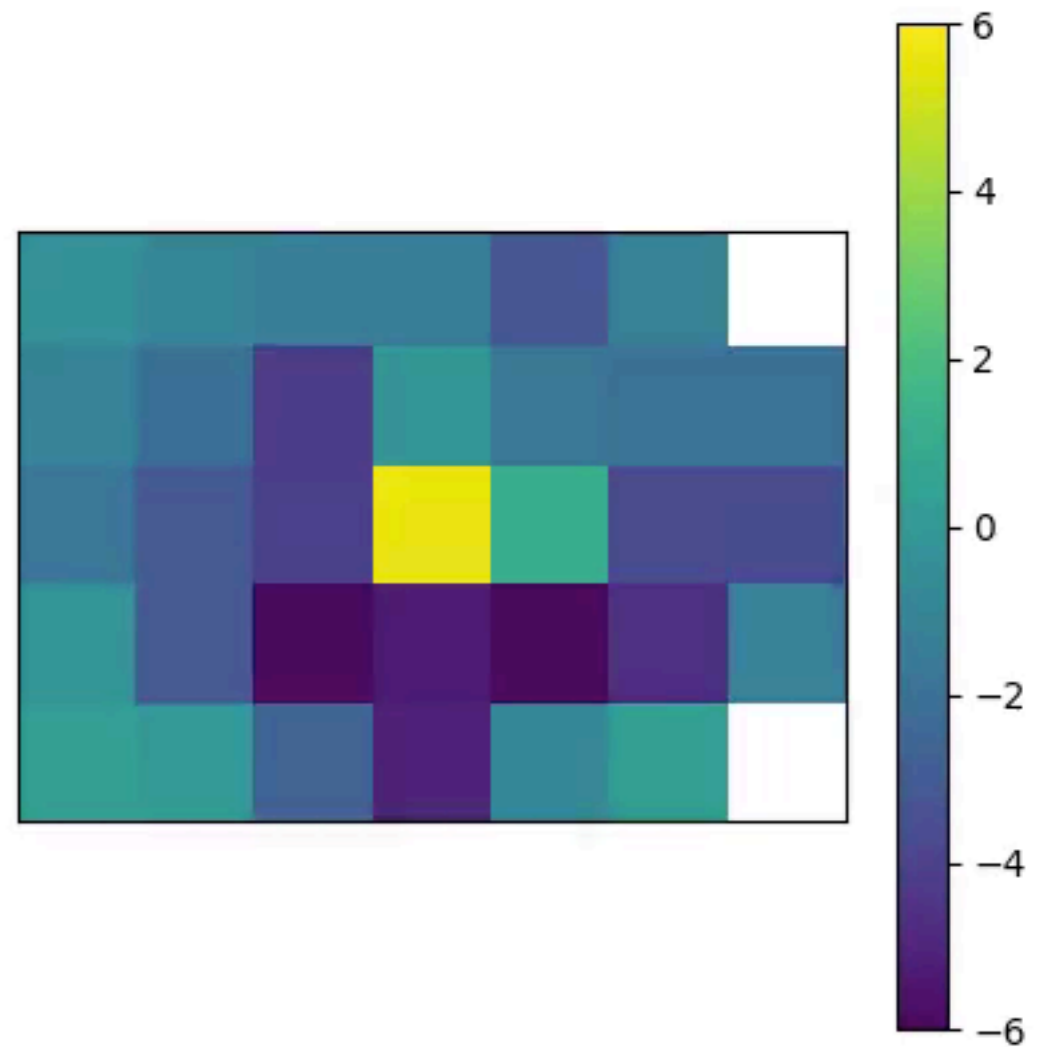
CHANGES IN THE PSF
PROVIDE INFORMATION

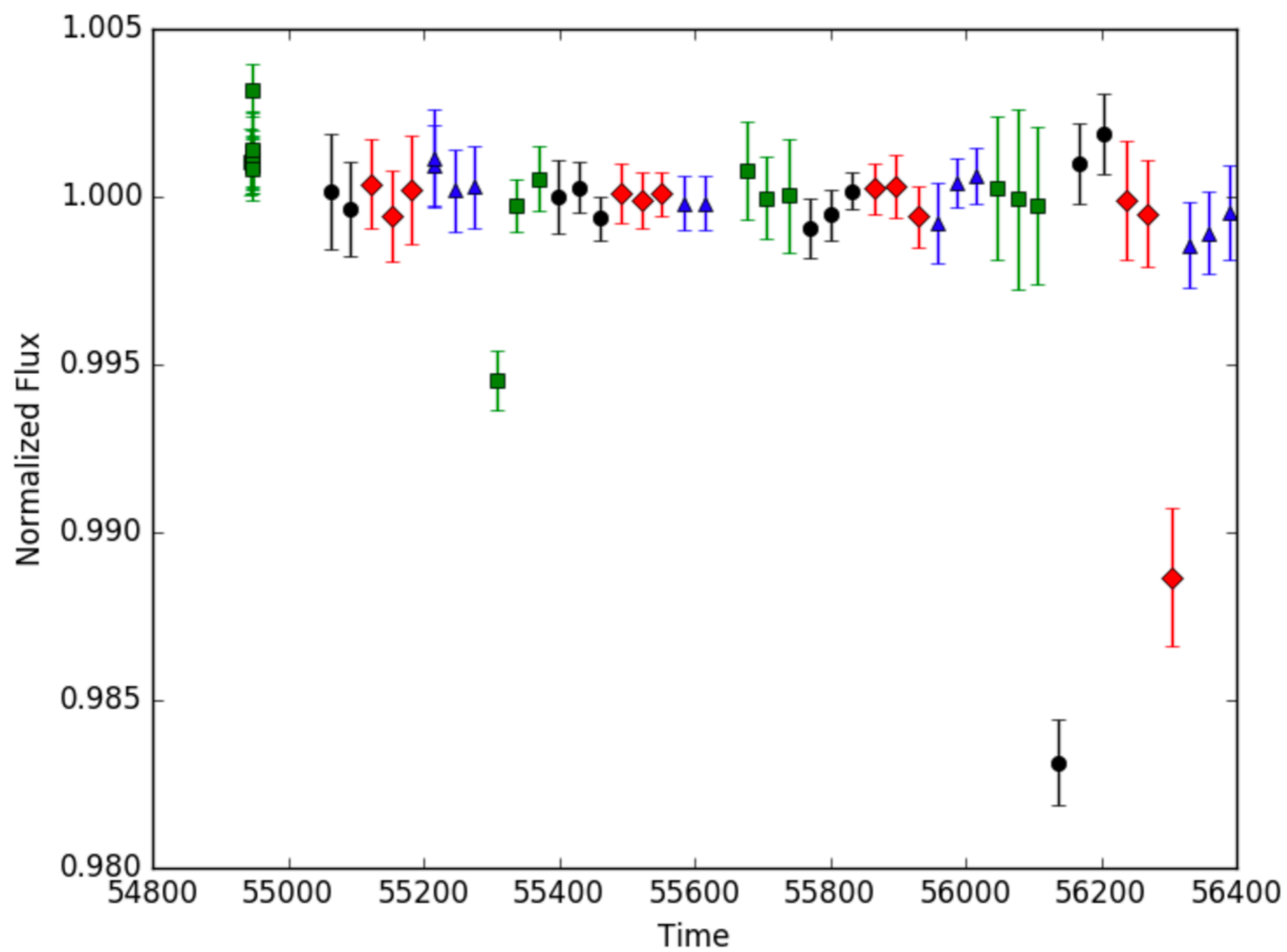
F3 CAN BE USED TO EXPLORE
LONG-TERM BRIGHTNESS VARIATIONS
(IT'S ON GITHUB!)

WE FIND A “TRANSITION” BETWEEN
SPOT- AND FACULA-DOMINATED
VARIABLE BEHAVIOR AT
ROTATION PERIODS OF 20 DAYS

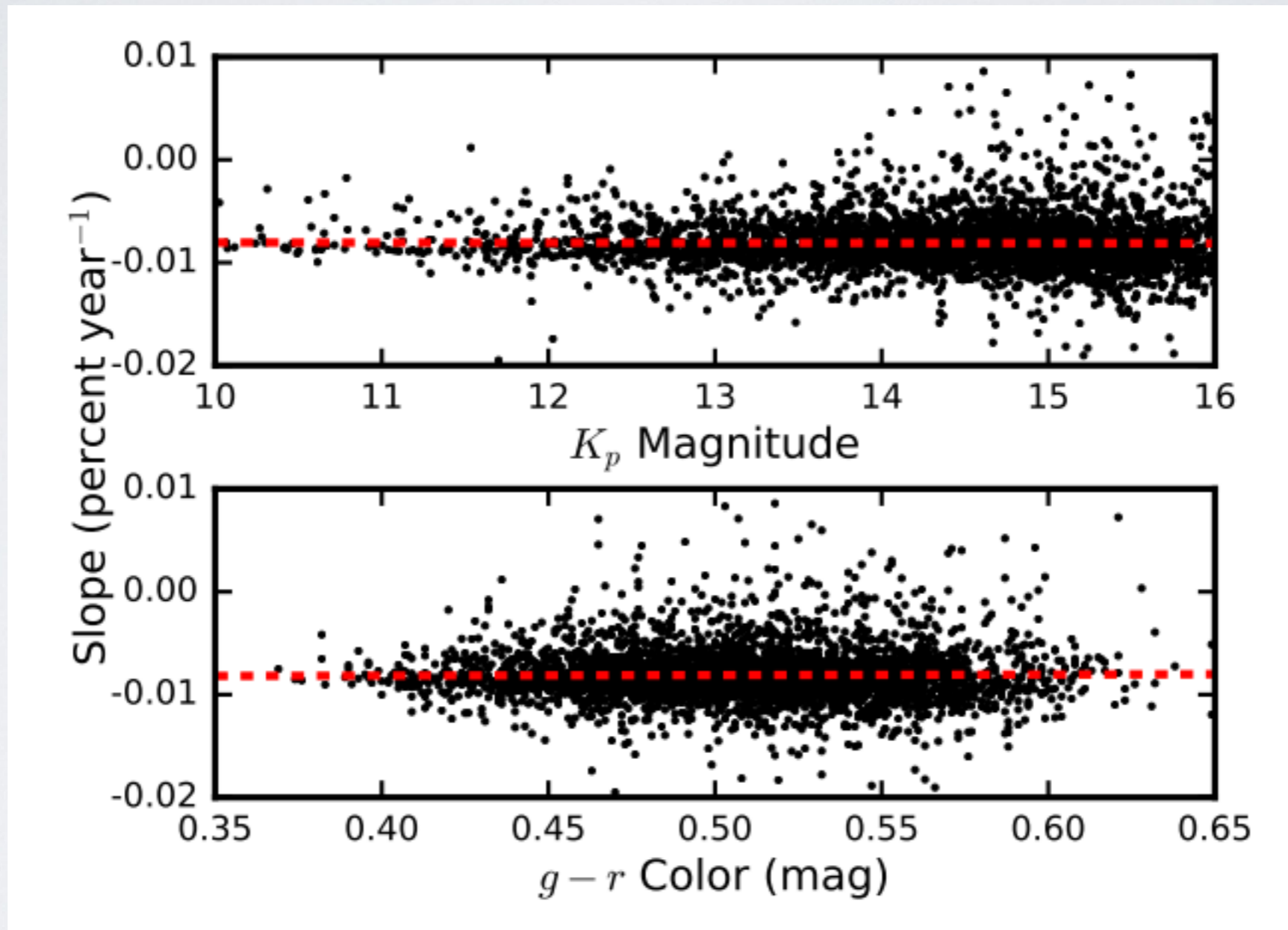
PSF MODELING IS THE FUTURE!

CHANGES IN
THE PSF CAN
TELL US ABOUT
ASTROPHYSICAL
CHANGES

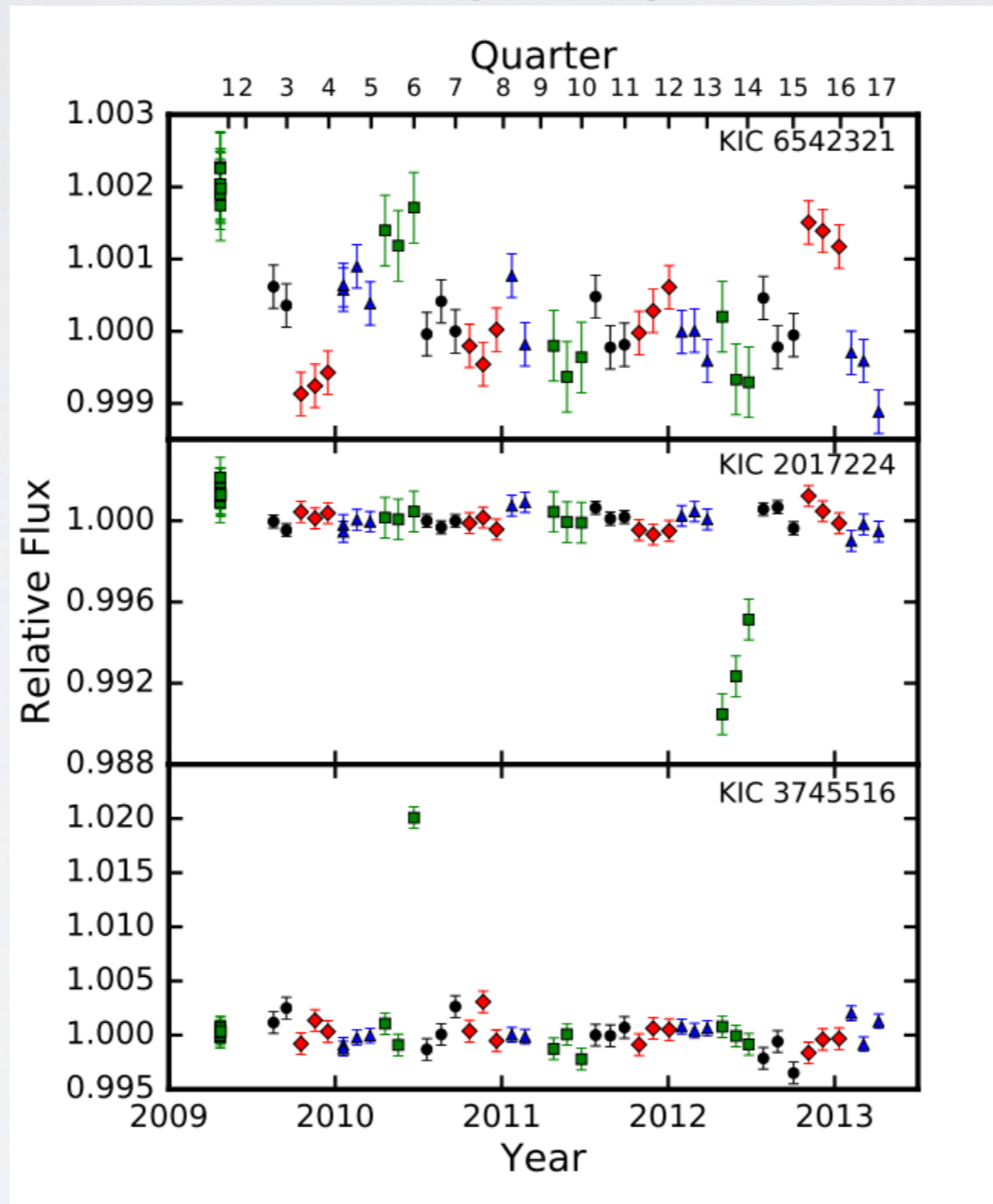




POTENTIAL SYSTEMATICS



OBSERVED SYSTEMATICS



BOTH DISTRIBUTIONS HAVE
THE SAME PROPER MOTION

