KMTNet Microlensing Experiment: current status and future plans

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&

KMTNet Team

2018. 1. 25
Observational Fields

from 2016

total : 27 fields

3x2 main fields +
21 outer fields
Pipeline

- DIA photometry
  - all 2016/2017 data finished
  - Delta_flux light curves
Event-Finder

step 1: run Event-Finder
step 2: eye check
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• 2015 : 842 events (clear 660 + possible 182, 4 fields)
  (only KMTNet events : 177)
  - data release (kmtnet.kasi.re.kr/~ulens/event/2015)
  - Event-Finder paper (Kim et al. AJ, 2018, in press)
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• 2016 :
  - step 1 : 564,010 candidates (27 fields)
  - step 2 : 2597 events - ( clear 2065 + possible 532 )

⇒ detection efficiency : 0.5%
Event-Finder

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• 2016 :
  - step 1 : 564,010 candidates (27 fields)
  - step 2 : 2597 events - ( clear 2065 + possible 532 )

  → detection efficiency : 0.5%

• 2017 :
  - step 1-1 : 583,525 candidate (27 fields)
  - step 1-2 : automatic variable/artifact elimination
    => 214,438 candidates (decreased by 37%)
  - step 2 : 2355 events (clear 2040 + possible 315)

  → detection efficiency : 1.1%
microlensing candidates

CV candidates
KMTNet-K2C9 fields

overlapping fields: KMTNet BLG02 & BLG03

265 events (clear 181 + possible 84) found!
KMTNet-K2C9 fields

overlapping fields: KMTNet BLG02 & BLG03

All KMTNet-K2C9 events: data release
(DIA & PySIS)

kmtnet.kasi.re.kr/~ulens/event/2016k2/
PySIS Photometry

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  - possible to do (quasi) real-time photometry
  - very important role in selecting the Spitzer target
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- 2016: data release w/ PySIS summer 2018?
- 2017: data release “as soon as possible”
High-Cadence KMTNet samples


OGLE-2017-BLG-0173
(Hwang+, AJ, 2018)

$M_{\text{host}} = 0.4M_{\odot}$

$M_p = 3.3M_E$ or $8M_E$
Collaboration with Spitzer

Close cooperation with Spitzer from 2015

- KMTNet covers Spitzer fields
- 58 microlens parallaxes measured
- 2016-2017 Spitzer season: concentrates on Spitzer targets
Data Policy (2015)


1. All 2015 data remain proprietary until 8 papers (including Event-Finder) accepted (priority period) - priority period ended Dec 15

2. During the priority period, anyone can write a paper using the KMTNet data, but they cannot be submitted for publication (including arXiv).

3. Welcome collaboration with the KMTNet team, but co-authorships not required.

4. Co-authorships required only in cases that the additional data processing (re-reduction data) are needed.

5. For OGLE/MOA events, it is required their permission to use KMTNet data (except only-KMTNet events).
Data Policy : K2

- Full immediate access to KMTNet events
  - No “wait time” for acceptance
- Strongly encourage KMTNet co-authorship
- Permission from OGLE/MOA required for K2-nonKMT events
Data Policy (2016+2017)

• Same as 2015
Future Plans

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- Measure the event detection efficiency of KMTNet by injecting fake events (image level) into the pipeline
- Improve Event-Finder algorithm using a machine-learning method
- Improve the automated PySIS pipeline for the 2018 Spitzer season