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Proposal ID: P0019

Neck-line Structure Associated with 2007 Megaburst of 17P/Holmes

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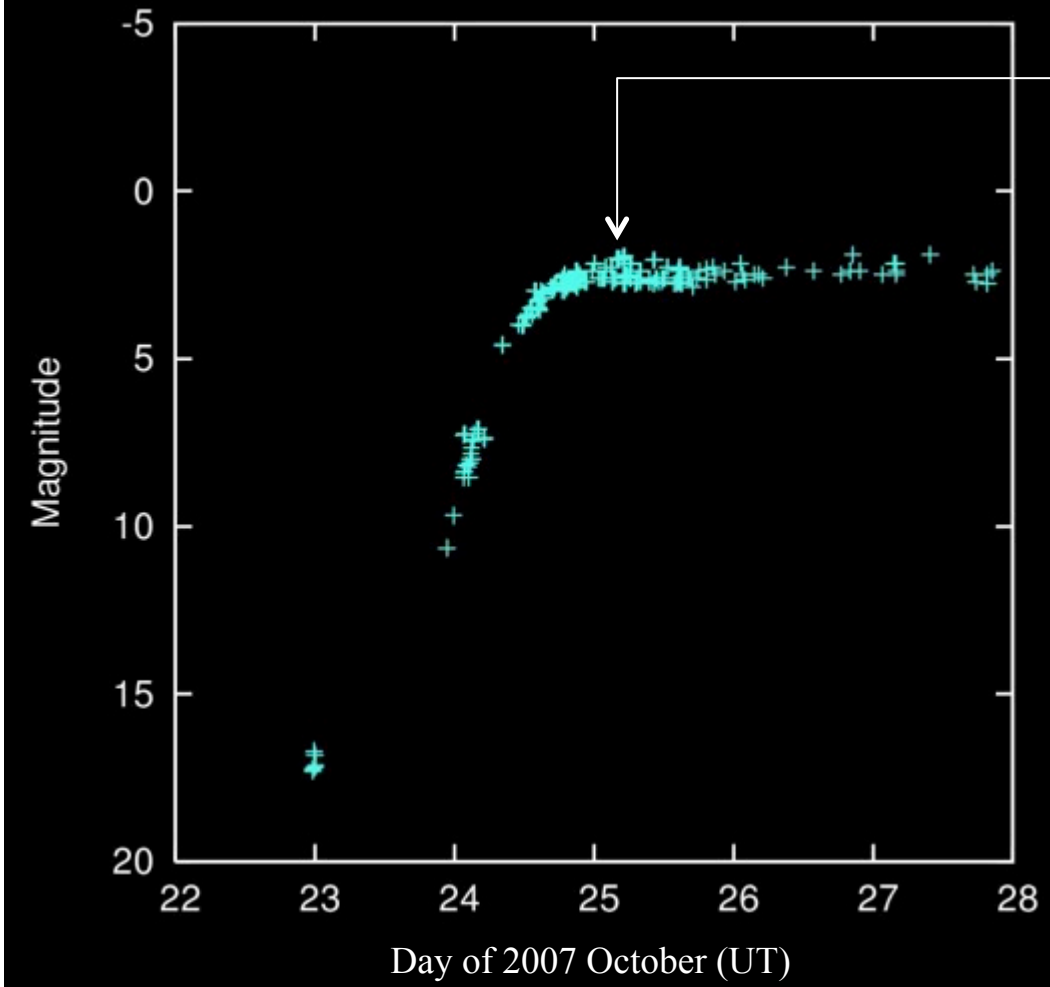
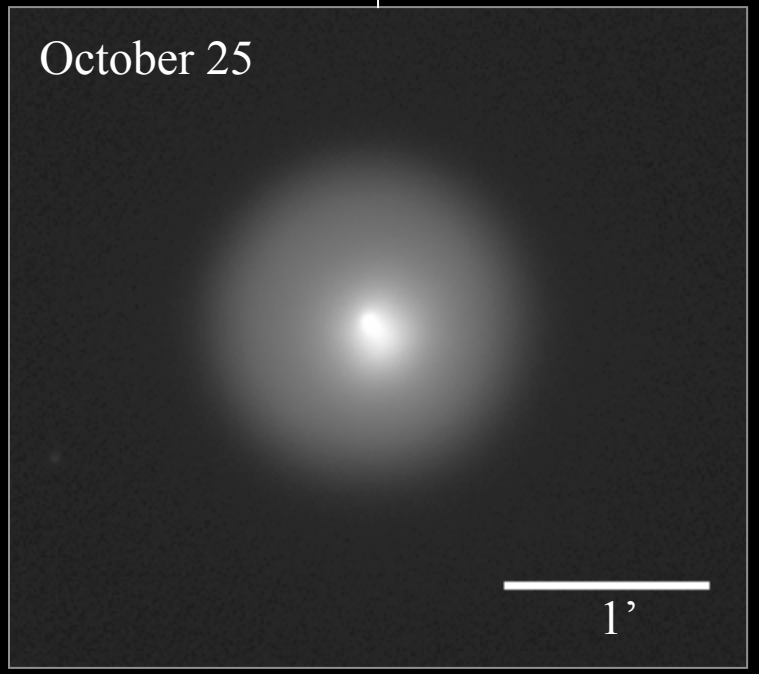
1-1. Introduction: 17P/Holmes Outburst

8 years ago,

a comet was suddenly brightened to be visible to the naked eye





afterward,

Summary of the 2007 Outburst

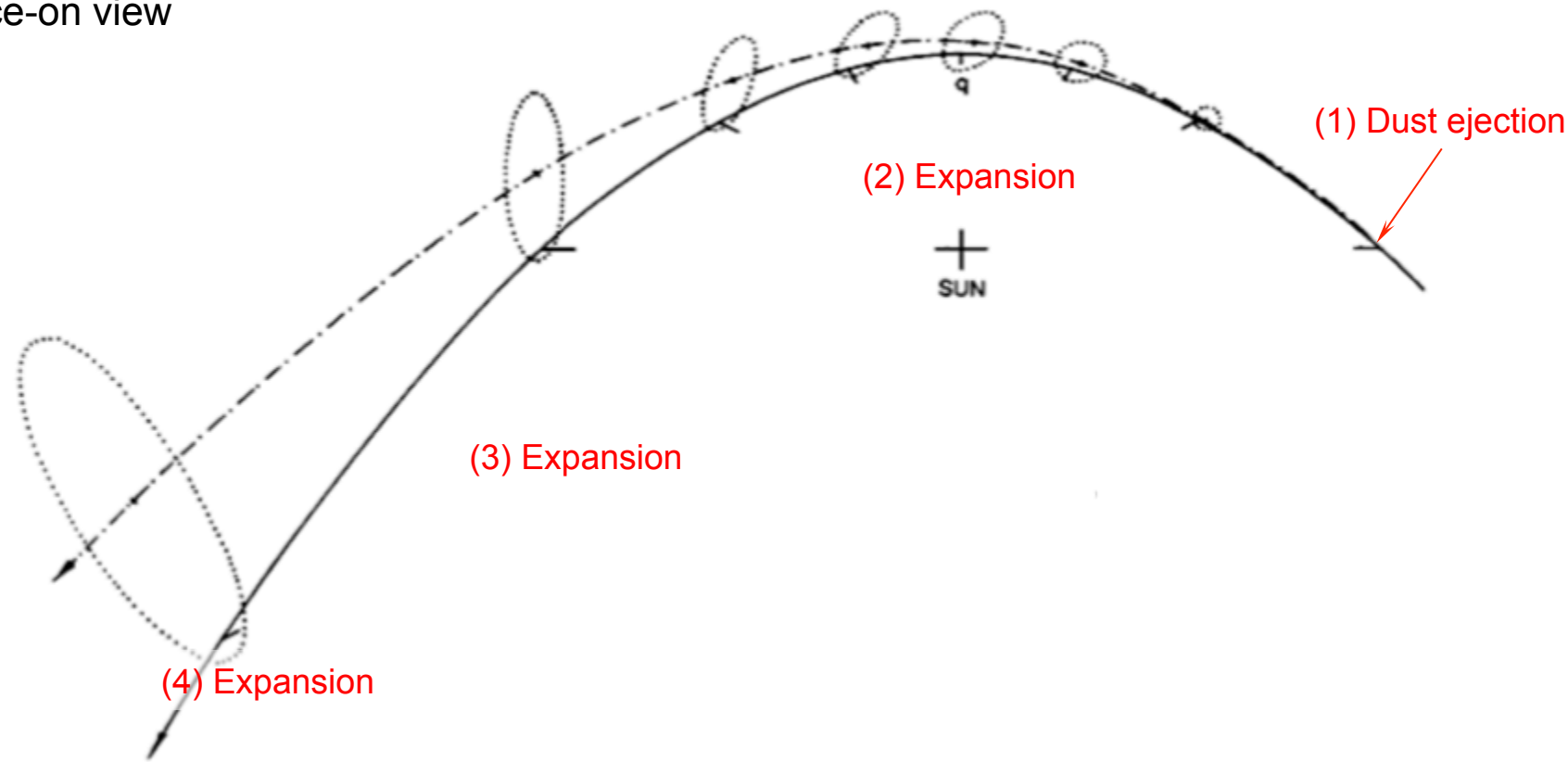
- 11.2 μm peak of a crystalline silicate feature onto a broad amorphous silicate feature. Internal dust grains? (Watanabe et al. 2007)

- Ejecta total mass [kg]
  - Montalto et al. (2008) 10^{12}-10^{14}
  - Sekanina (2008) 10^{11}
  - Altenhoff et al. (2009) 4.3×10^{10}
  - Ishiguro et al. (2010, 2013) $>4\times10^{10}$

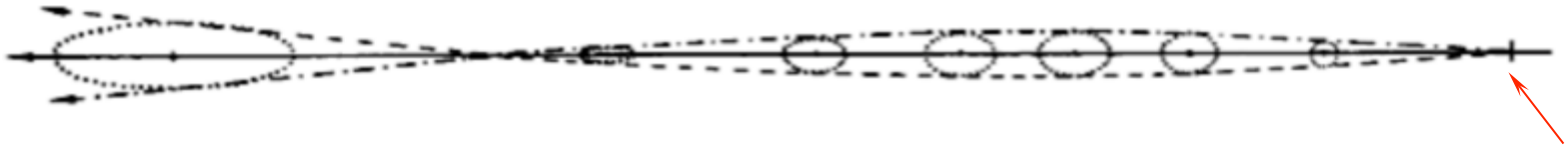
- Suggested mechanism for the outburst
  - Vaporization of more volatile ice (CO_2 or CO)
  - Crystallization of amorphous H2O ice
  - Impact (most unlikely)

1-2. Introduction: Neck-line Structure

Face-on view



Edge-on view



(4) Expansion (3) Convergence (2) Expansion (1) Dust ejection

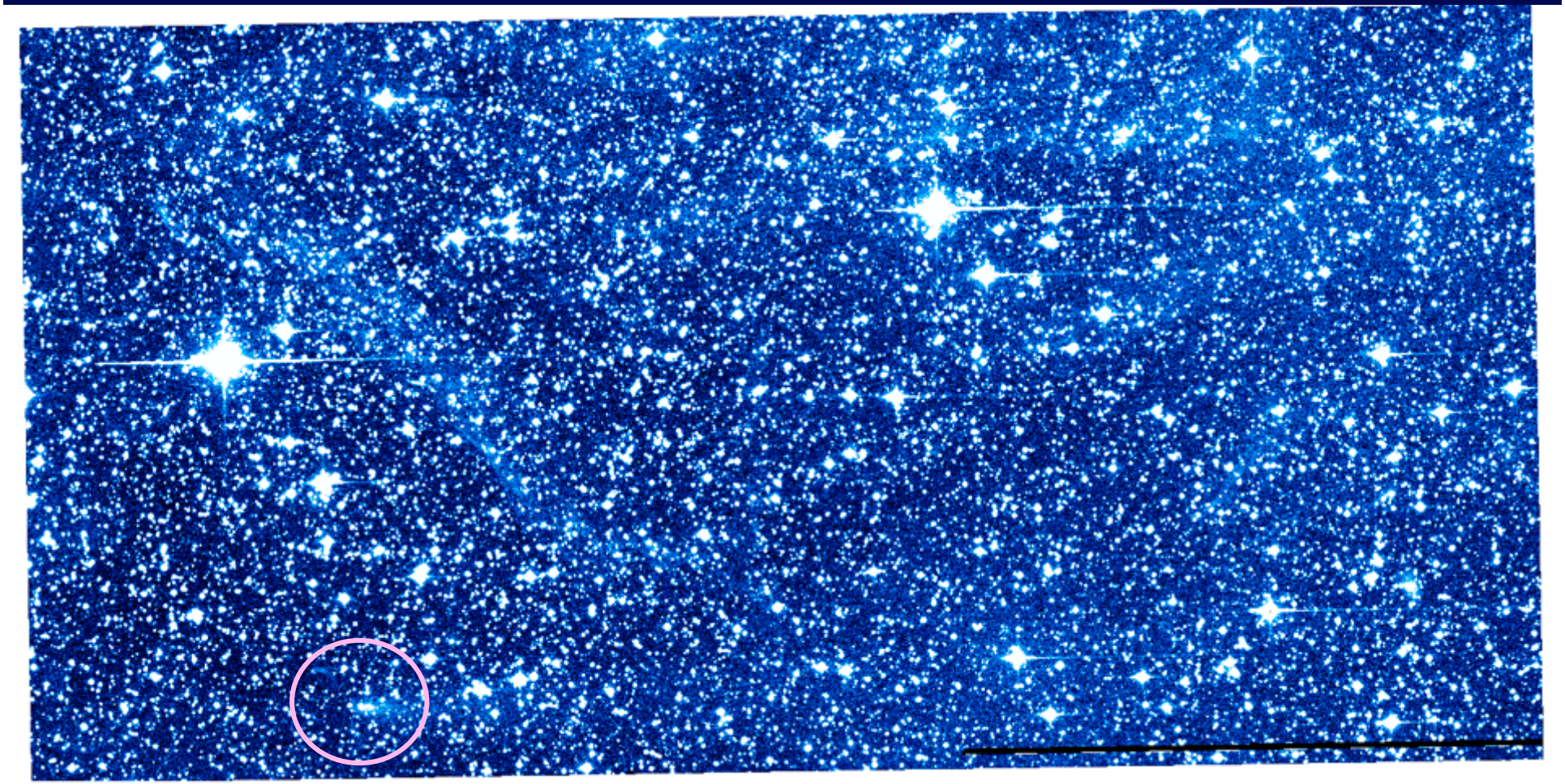
Original figure from Fulle & Sedmak (1988)

2.-1 Observation and Data Reduction

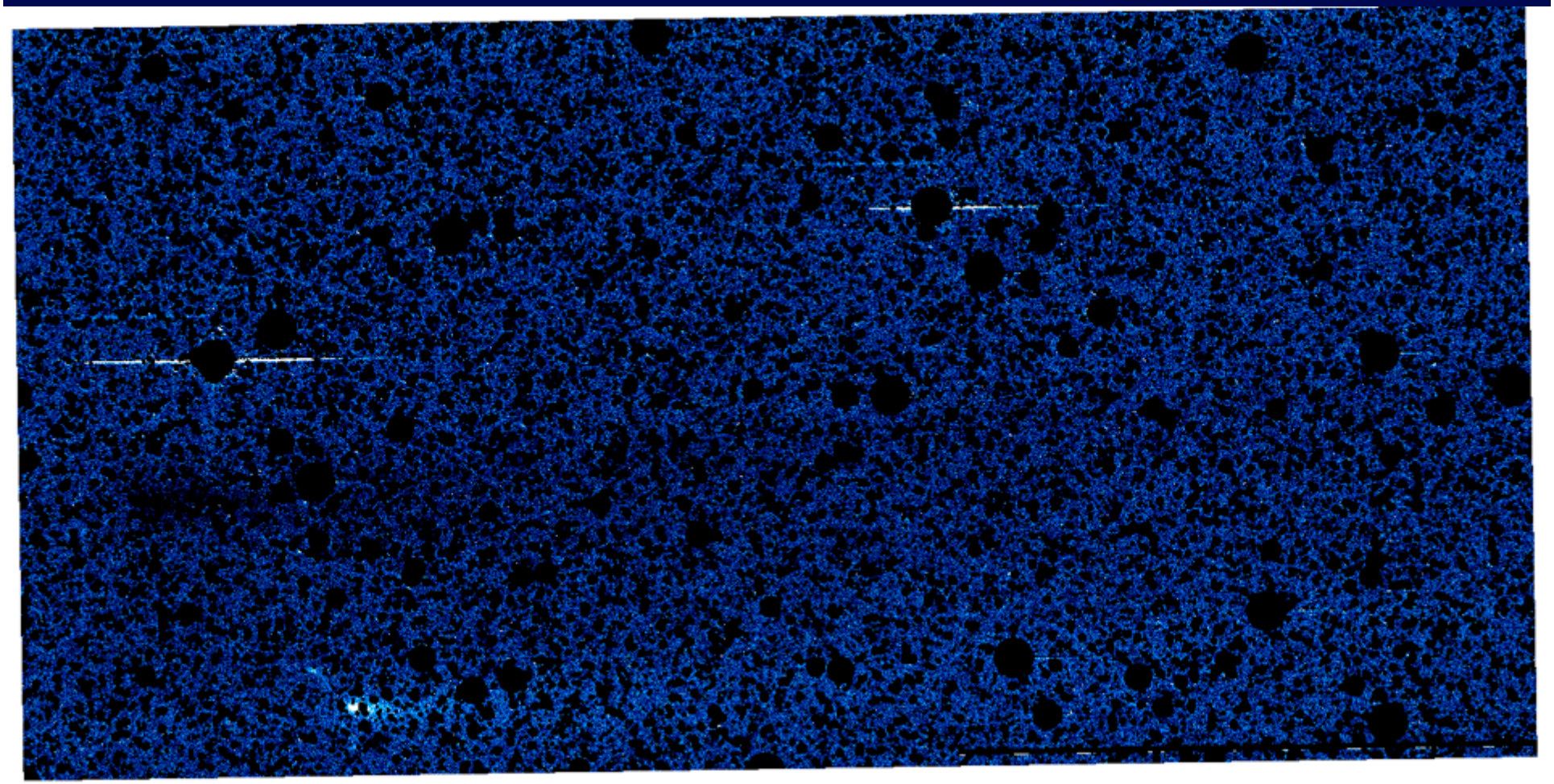
- The comet was located at the hypothetical convergent point on UT 2014 September 15. However we could not make the observation because of the moon.

- Our observation program (P0019) was allocated 7 second half nights (i.e. 0.5x7=3.5 nights) from September 18 to September 24, 2014. In addition, we observe the comet on September 25 during the time frame of the KISS survey. We acquired the data for four nights during the period.

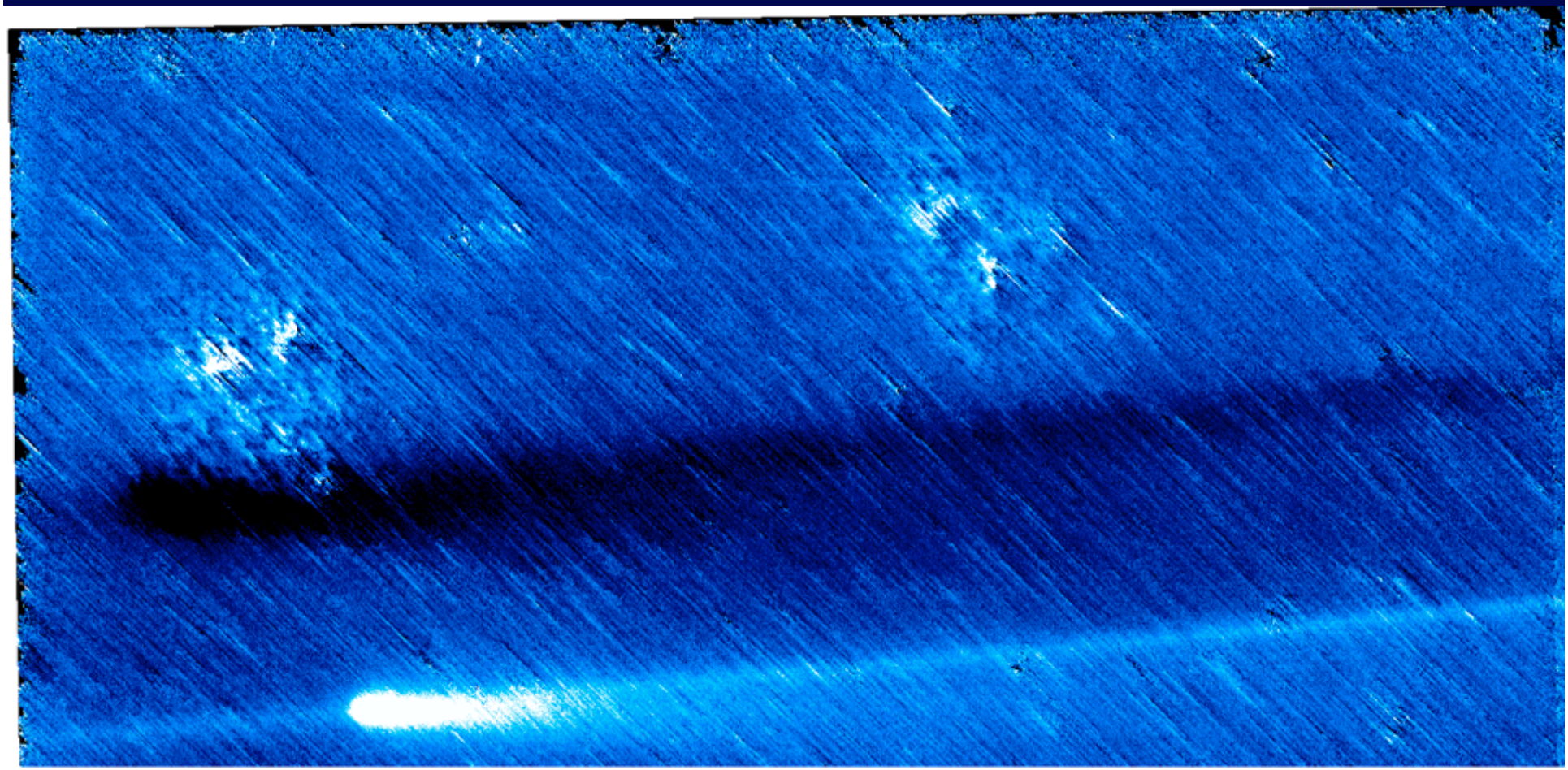
- We employed the KWFC with R_C-band filter. Mode 14 (four MIT CCDs without binning) was applied to reduce the readout time.



An image after preprocessing



An image after image subtraction and star masking



Composite images using sixty masked frames

- We will submit the results to a refereed journal in about a month.
- The detail results will be reported there.