OJ287 の 2015年アウトバースト時に おける電波強度変動

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The target source OJ 287

- BL Lac object at z=0.3. (1 milli arcsecond = 4.5pc)
- It is known to show a rapid variability across a wide range of wavelength.
- It exhibits double-peaked periodic optical outburst at a period of approximately 12 yrs.
- A binary black hole model suggested[1,2]
  - A secondary body crosses the accretion disk of the primary black hole and produces two impact flashes per period.
  - The first outburst is a thermal flare which is visible only in the optical regime.
  - About 1 yr later, the disturbance has propagated down the relativistic jet and results in the growth of new synchrotron-emitting shocks, which is visible both in optical and radio regimes.
- The most resent flares occurred in December 2015[3] and February 2016[4]
  - We here show the monthly VLBI monitoring observations from 2015 October to 2016 April.

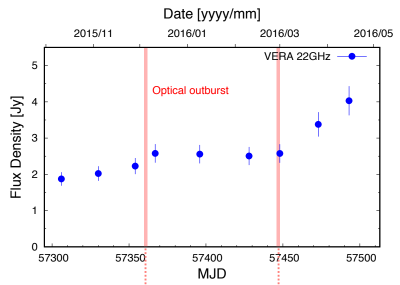
Observations & data reduction

- VERA common use observations
  - 9 tracks from 2015 October to 2016 April
- Calibration, data flagging, fringe fitting and imaging were performed using the NRAO AIPS software.

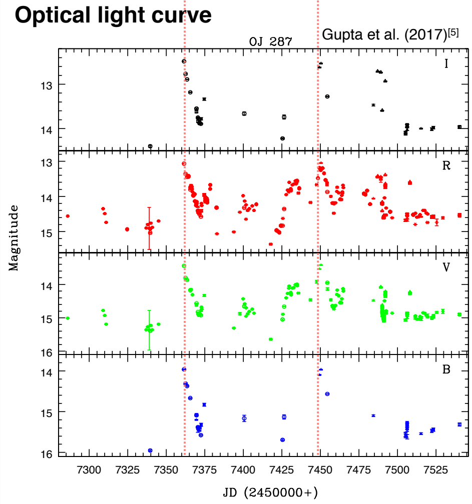
Target source	OJ 287
Frequency band	K (22 GHz)
Array	VERA
Monitoring period	2015 Oct — 2016 April
Correlator	NAOJ correlator

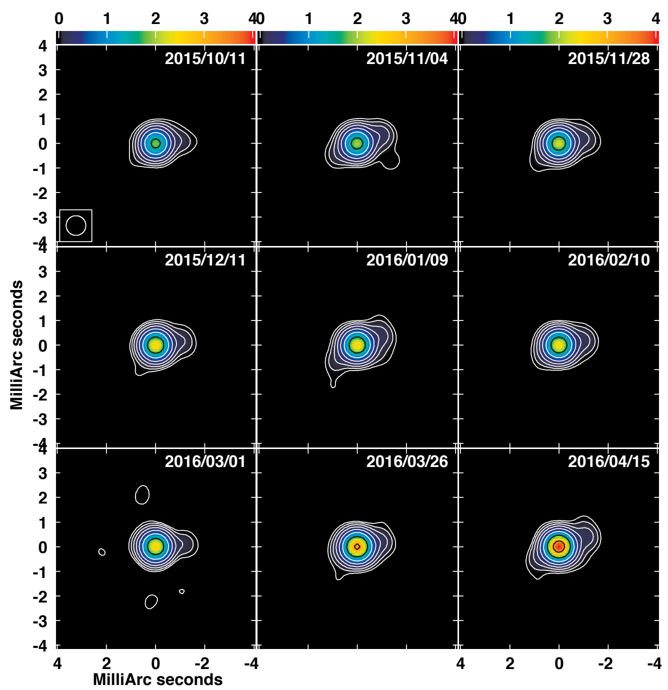
Results

Radio light curve



Optical light curve





- Our VLBI images show that the 22-GHz radio emission is dominated by the compact core component at all epochs.
- The 22-GHz radio emission seemed to increase slightly at the first optical outburst in Nov/Dec of 2015. After the second optical flare in Feb/Mar of 2016, the radio flux started to increase to almost twice.

1. Valtaoja et al. (2000), ApJ 531 744
2. Valtaoja et al. (2008) Nature 452 851
3. Shappee et al. (2015), The Astronomer's Telegram, 8372
4. Zola et al. (2016), The Astronomer's Telegram, 8667
5. Gupta et al.(2017), MNRAS 465 4423