AGN jet science with KVN plus VERA

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Abstract

Active galactic nuclei (AGNs) is one of the key targets of KVN plus VERA array. In this proceeding, we present our activity in the KVN+VERA AGN sub-WG. Lastly, we include the actually obtained *uv* coverages data obtained in the test observation of AGN jets with KVN+VERA in November 2011 just after this meeting.

1 Motivation

Observing jet bases in active galaxies on sub-parsec scale is crucial for exploring the jet formation mechanism. VLBI plays a unique role for imaging fine structures of the jet bases. By utilizing the advantages of (1) better image quality than VERA (KVN) alone and (2) having high frequency bands (22 and 43 GHz at present), we will explore open issues on jets which current VLBIs are not able to assess.

2 Introduction

Brief introduction of this AGN WG is shown in this section.

2.1 Membership

The AGN working group (WG) is open for those who are interested in AGN science with KVN plus VERA. Currently, about 30 people join in this WG. The affiliations of the members are as follow: NAOJ, Hokkaido Univ, ISAS/JAXA, Yamaguchi Univ, Kagoshima Univ, KVN/KASI, Yonsei Univ, Kyunjhee Univ, and Seoul National Univ. The PIs of the WG are B.W. Sohn (KVN/KASI) and M. Kino (NAOJ).

2.2 Performance of KVN

The Korean VLBI Network (KVN) is the first millimeter dedicated VLBI network. The three 21 m antennas of KVN are located in Seoul, Ulsan and Jeji Island. The specifications of quasi optics, receivers, and back-ends, and the single-dish performance tests conducted in 2008-2011 at 22 and 43GHz are shown in Lee et al. (2011). The pointing accuracies are less than 3" in azimuth and elevation. The measured aperture efficiencies are greater than 64% at 22GHz and greater than 62% at 43GHz.

3 Test observation of AGN jets with KVN+VERA

The test observation was conducted at the end of November 2011. The V-con workshop was held just before this actual test observation with KVN+VERA. Hence, in the workshop, I presented our test observation schedule and the VERA follow-up observation of giant γ-ray flare of 3C454.3 in 2010 November (Akiyama et al. in prep). Such a follow-up observation will be one of the main topics of KVN+VERA science.

3.1 Observation Schedule

Initially we tried to include following five sources in the test observation: 4C39.25, 3C279, 3C273, M87, and PKS1510-089. Unfortunately, PKS1510-089 had the problem on the separation angle from the sun. Therefore we gave up the observation. The schedule plan (before removing PKS1510-089) is shown in Fig. 1.

3.2 *uv* coverages: VERA-only vs VERA+KVN

In the middle of January 2012, we obtained the correlated data for the observations (r11320a and r11330c). In Fig. 2, we show the *uv*-coverages for M87 observations with VERA and KVN+VERA.

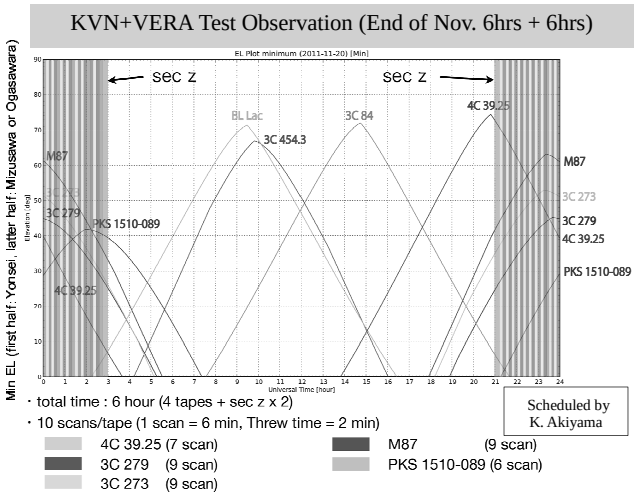

Figure 1: The minimum elevation of each source measured from KVN and VERA stations ploted versus universal time. The observation time is six hours in total.

References

[1] Lee S. S. 2011, PASP, 123, 1398

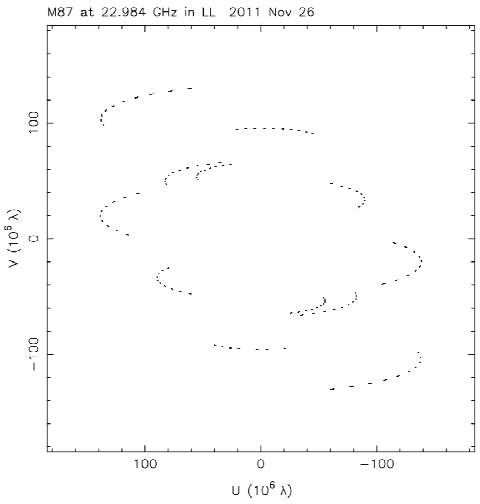

Figure 2: The *uv* coverage for M87 observation with VERA alone.

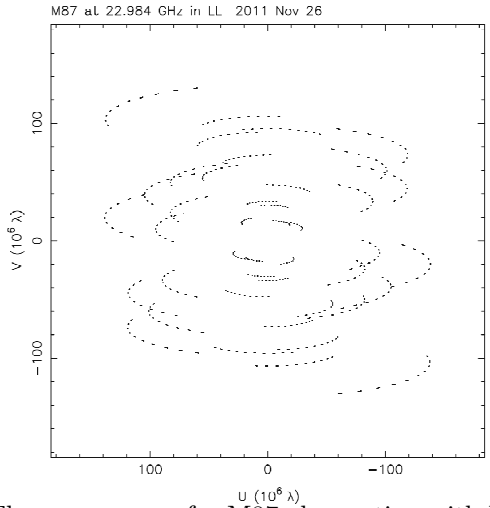

Figure 3: The *uv* coverage for M87 observation with VERA+KVN.